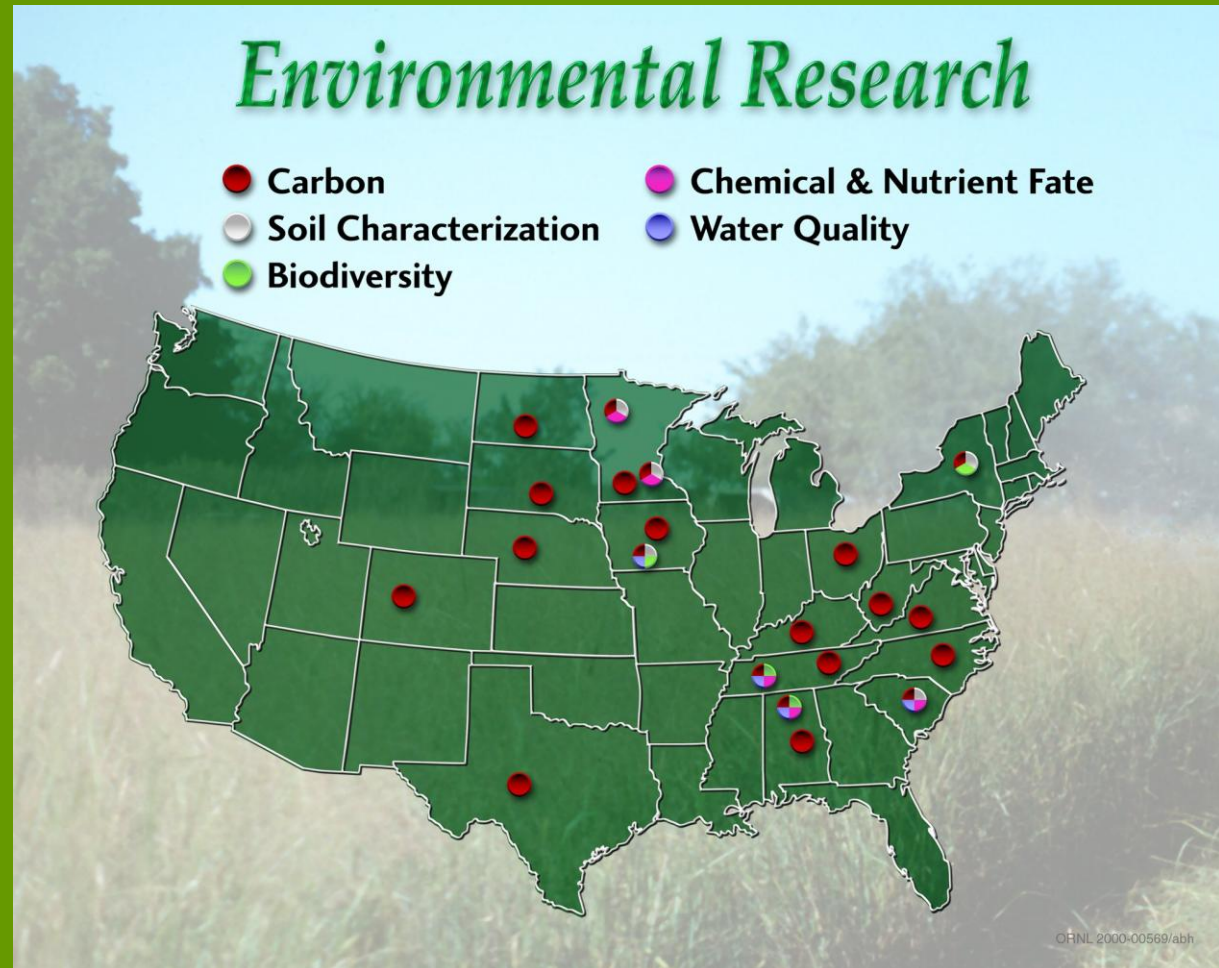


Research Methods Module

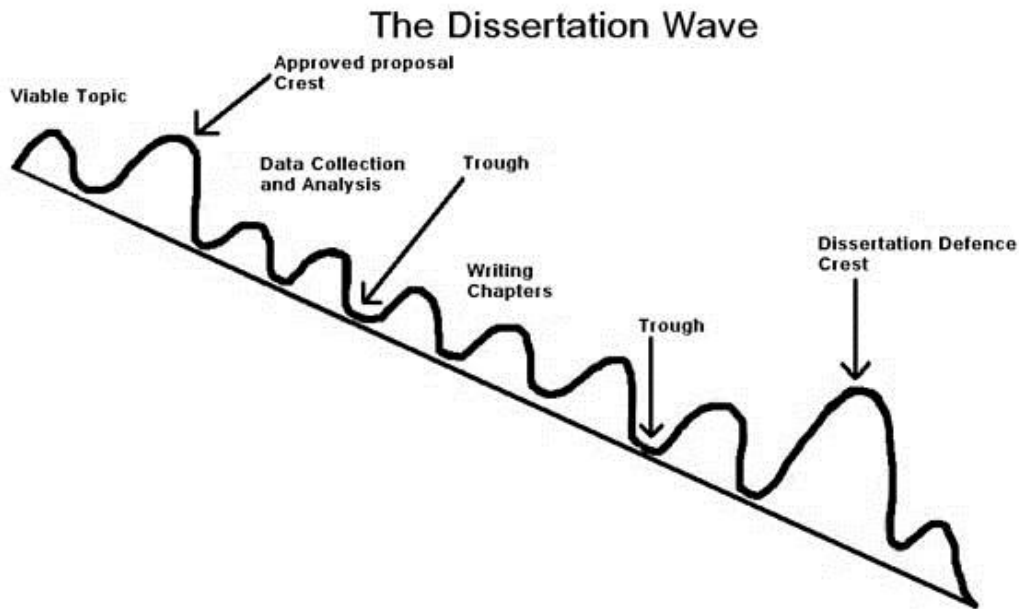
- Introduction
- BA/BSc Environmental Conservation
- Module descriptor
- Assessment and module format



What is research?



○ On the flipcharts answer the following:



- What do think is required in good research?
- What do you think is required in a good dissertation?

Good Research

S	SPECIFIC	Significant
M	MEASURABLE	Manageable, Meaningful
A	ACHIEVABLE	Attainable, ambitious, appropriate
R	RELIABLE	Relevant, Result based, realistic
T	TIMELY	Time management
E	EVALUATIVE	Enjoyable, engaging, ethical
R	REALISTIC	Rewarding. replicable
S	SATISFACTORY	Strategic

- Adapted from Doran (1981), Meyer (2003) Applied to performance indicators in management but also relevant to good research.

What makes a good dissertation?



Assessment		Module
Interim submission (oral presentation)	10%	10%
Introductory material	10%	
Originality and concept	20%	
Research	10%	
Analysis and Synthesis of Research	30%	
Referencing	10%	
Written/Verbal expression	10%	
Final Submission	90%	90%
Total		100%

- Dissertation Assessment Criteria
- (Detail next slide)
- Dissertation module descriptor

GRADING: CRITERIA	3rd (35% - 49%)	2·2 (50% - 59%)	2·1 (60% - 69%)	1st (70% and over)
INTRODUCTORY MATERIAL	Sufficient description of research area and aims	Clear description of the research background, hypotheses and setting	Consistent and logical introduction of the research and the significance of the hypotheses	Set the research in a very coherent form and effectively show the significance of the hypotheses for the academic community. Independent conceptual proposal and development.
ORIGINALITY AND CONCEPT	Limited appreciation of issues and consideration given to structure and format	Clear understanding of issues and structured presentation	Rational and logical understanding of issues and originality of approach	Thorough, logical understanding leading to insights and clear critical thinking of the literature and originality of the research
RESEARCH	Sufficient description of an appropriate methodology	Wider reading demonstrated of relevant methodology	Identification and application of current research into topic	Wide-ranging use of appropriate and imaginative research methodology
ANALYSIS AND SYNTHESIS OF RESEARCH	Some critical analysis and application	Some analysis, application and synthesis of appropriate primary research	Application, analysis and evaluation of appropriate primary research	Evaluation of research used to develop new concepts and contribute to the academic debate
REFERENCING	Limited use of referencing	Use of appropriate referencing system	Consistent use of referencing system	Consistent and accurate use of an appropriate referencing system
WRITTEN/ VERBAL EXPRESSION	Meaning not always clear, partially gets to the point	Meaning generally clear with points illustrated	Meaning clear and fluent with logical flow	Very fluent, concise with clear logical flow

Some explanations

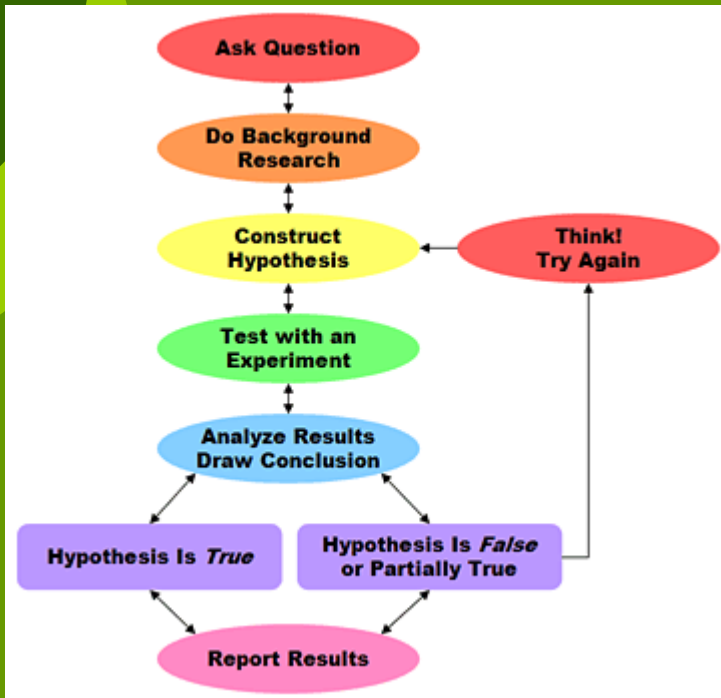
- **Written Report:** a document describing the findings of some individual or group, communicated in the written form.
- **Dissertation:** a treatise advancing a new point of view resulting from research; a requirement of most advanced degrees
- **Treatise:** A formal exposition.
- **Thesis:** An unproved statement put forward as a premise in an argument. It is the requirement of an advanced degree when presented as a treatise.

(Brown, pers comm. 2009)

Jones & Gomez (2010) Research is theory to practice and vice versa



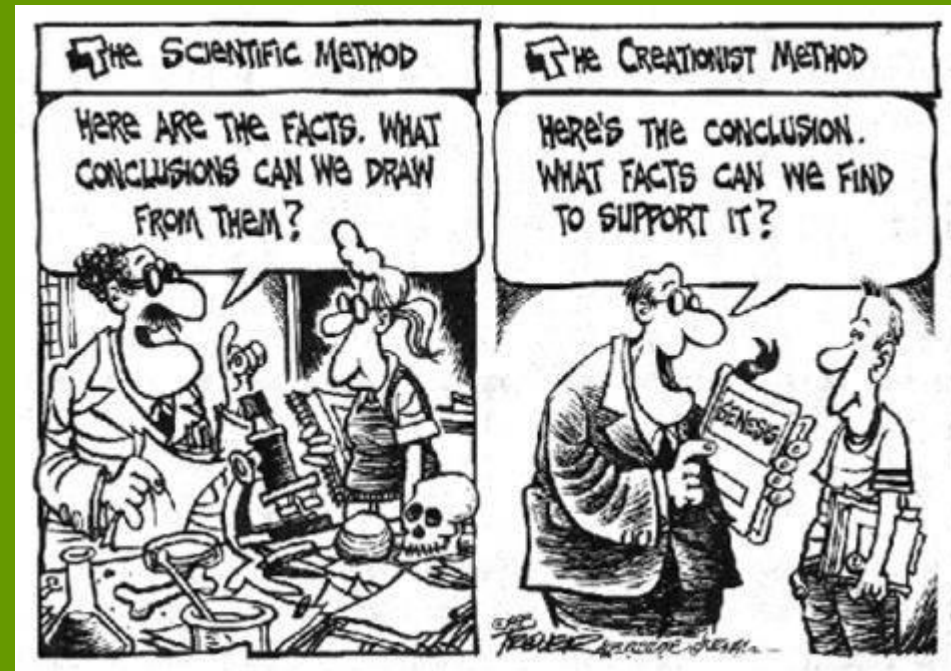
The Scientific method



- **Empirical**: derived from experiment and observation is more appropriate than human induced theory.
- Formulate hypotheses: test
- Hence link theory to measured observation (positivism, Comte 1820s)
 1. Logical positivism (Inductive reasoning) creates a Law
 2. Critical rationalism (Deductive, Popper) Falsify the hypothesis

No single Scientific Method

- Science moves forward by trying to solve differences between findings discovered by different methodologies (Law, 2001)
- Creates a rich and diverse subject
- Field, Laboratory and models
- monty scientific method



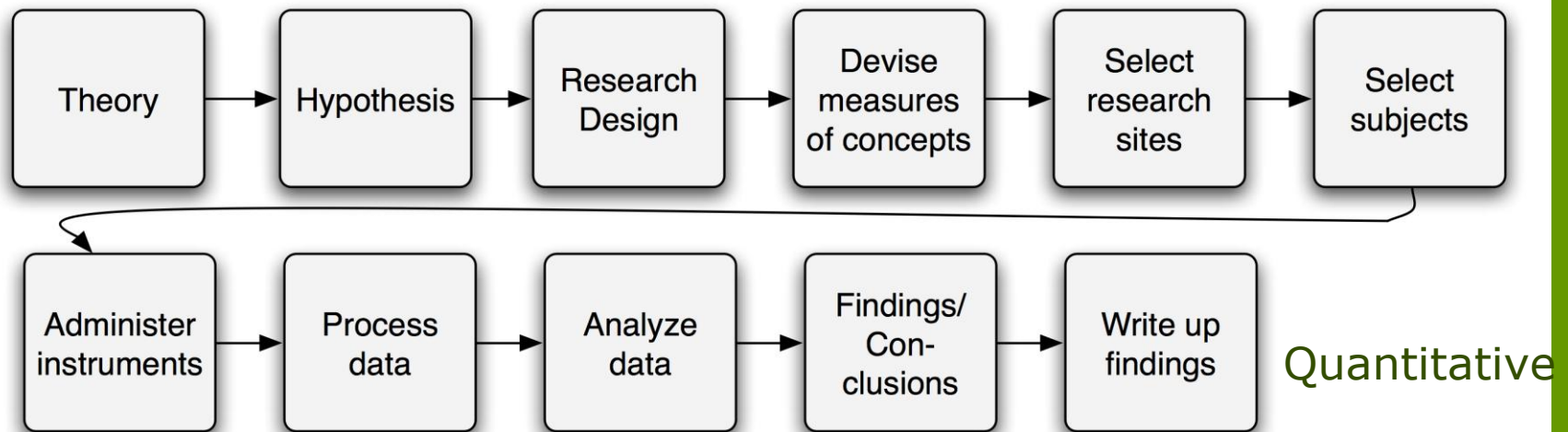
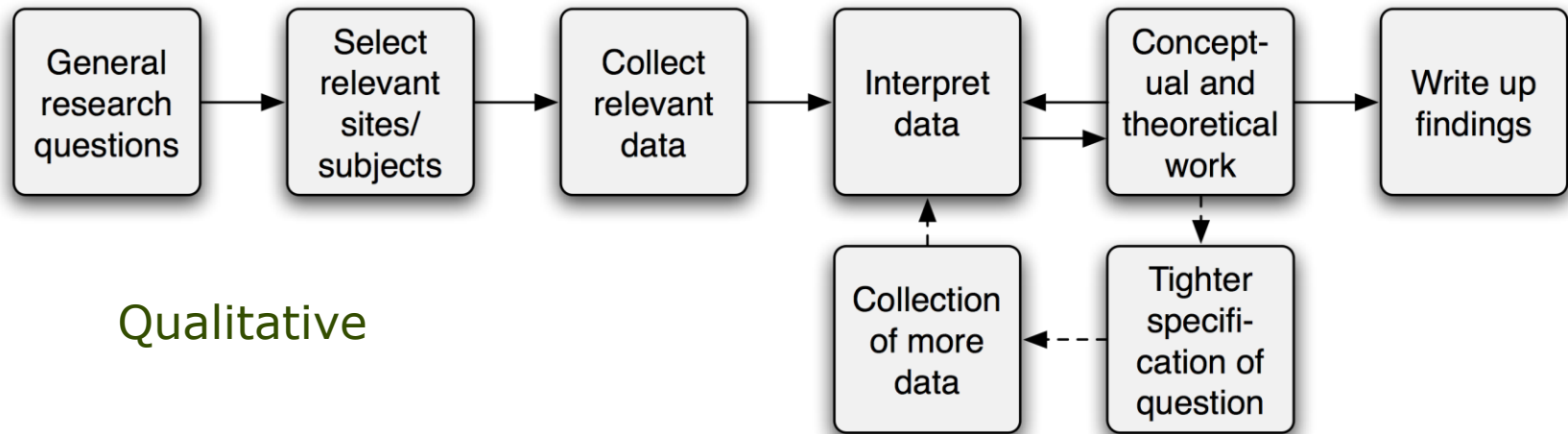
Is there a Dichotomy between Qualitative and Quantitative Research Techniques?

- **Introduction**

"The purists assert that qualitative and quantitative methods are based in paradigms that make different assumptions about the social world, about how science should be conducted, and what constitutes legitimate problems, solutions and criteria of 'proof' (Burns, 2000, p. 388)

Schematic of research process

(Copernicus Consulting, 2013)



What is Qualitative Research?

- 'truth' and 'knowledge'
- 1960s and 70s (humanistic)
- reflect the multiple realities of society
- "since humans are conscious of their own behaviour, the thoughts, feelings and perceptions of their informants are vital" (*ibid.*)
- behaviour and meaning



A Comparison of Qualitative and Quantitative Research (Silverman, 2000: 2)

- **Qualitative**

- Soft
- Flexible
- Subjective
- Political
- Case study
- Speculative
- Grounded

- **Quantitative**

- Hard
- Fixed
- Objective
- Value-free
- Survey
- Hypothesis testing
- Abstract

What type of research method should we be using?

- Beyond the social sciences
Quantitative dominates.
 - Journalists bias (Denzin & Lincoln, 1994)
 - Public varies & Media
 - Government & Business
 - 1990s reliability
- Should be based on what you are trying to achieve / understand

Some Methods of Quantitative Research (Bryman, 1988, p. 11)

○ **Method**

1. Social Survey
2. Experiment
3. Official Statistics
4. Content analysis

○ **Features**

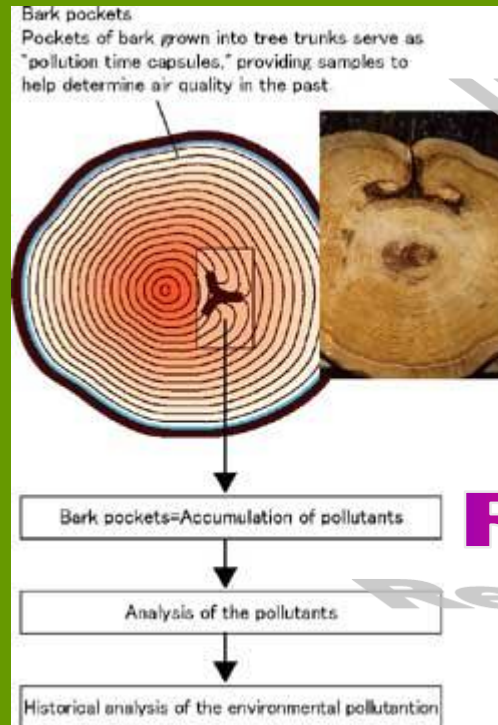
1. Random/measured variables
2. 'control group'
3. Analysis others data
4. Categories: count content of text

Some Other Points

- Independent Vs dependent variables (next session)
- Quant. are reluctant to move from correlation to causal relationships
- e.g.. Rum Vs Methodist
- Uses a special language and conceptual lenses
- Not for LAWS but for cumulative generalisations
- 'the cart leading the horse'
- Conclusion

Some Fundamental Environmental Research Concepts

Variables



Hypotheses

Reliability & Validity

Independent and dependent variables

Independent variable: the variable that the experimenter manipulates to see whether it has an effect on the other variable.

Dependent variable: the variable which is dependent on the way in which the experimenter manipulates the independent variable.

Cause
IV

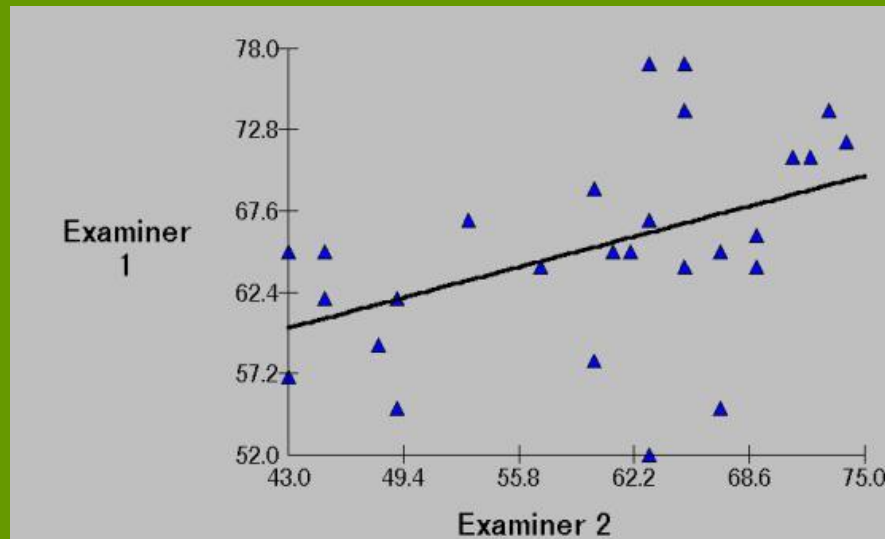


Effect
DV



Null hypothesis

- It must be possible for the predicted effects to occur or not to occur
- Null hypothesis: predicts that there is no relationship between the two variables
- It is only after a statistical test has been performed, and if the difference between the scores is big enough, can we reject the null hypothesis and accept the alternative (experimental) hypothesis.



Nature of the Hypothesis

- An hypothesis is a specific statement of prediction. It describes in concrete (rather than theoretical) terms what you expect will happen in your study.
- There is a null hypothesis (H_0) and and experimental or alternative(H_1)
- Hypotheses can be one-tailed or two tailed – difference or direction

One tailed/ two tailed hypotheses

One tailed hypothesis: states the direction of the difference

One tailed tend to use words like 'reduce', 'increase', 'lower', 'raise'.

e.g. increasing the number of hours studying will improve exam results (even in energy and the environment)

Two tailed hypothesis: states there will be a difference, but does not state the direction

Two tailed tend to be vaguer and involve words like 'influence', 'affect', 'change'

e.g. there are gender differences in terms of perceptions of conservation

Simple Example

The effect of taking tranquillisers on the exam performance of students.

- Hypothesis: students will benefit from them

- Methods

Before the exam, students who had requested tranquillisers were identified and formed the experimental group.

Students from the same class were also selected and matched with students in the experimental group on such variables as previous exam results, IQ, gender and medical records. These formed the control group.

Think about it...

1. What are the IV and DV?
2. What is the null hypothesis?
3. Is the experimental hypothesis one-tailed or two-tailed?
4. Which variables have been controlled?
5. Which relevant variables have not been controlled?
6. What criticisms of the experiment could you make?



Answers

What are the IV and DV?

IV: use of tranquillisers DV: exam marks

What is the null hypothesis?

There will be no effect of tranquillisers on exam marks

Is the experimental hypothesis one-tailed or two-tailed?

One tailed

Which variables have been controlled?

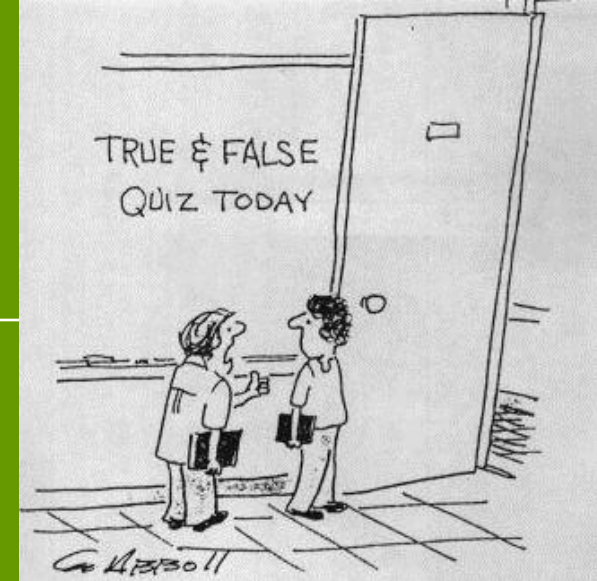
All variables that have been matched eg previous exam results, IQ, gender and medical records

Which relevant variables have not been controlled?

Anxiety, fatigue, meals eaten before exam

What criticisms of the experiment could you make?

Experimental group came forward – bias group



Reliability

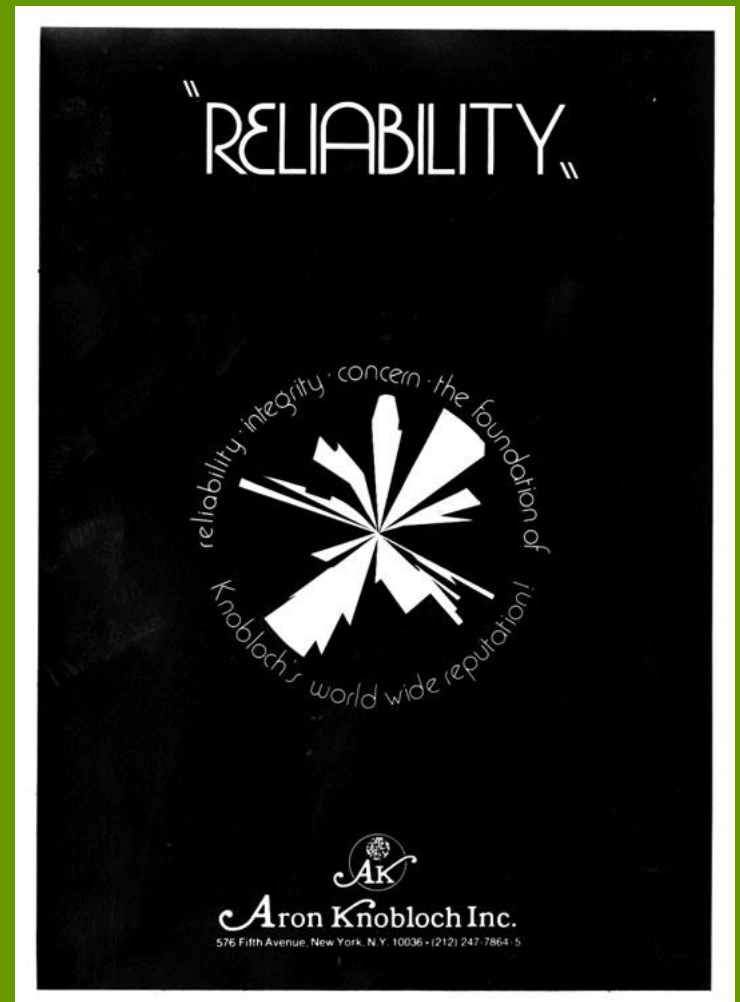
- Results should be consistent
- The results of an experiment should be the same when re-tested on the same people at different times.
- If they are not consistent it indicates random error
- Read Golafshani article moodle)

The Qualitative Report Volume 8 Number 4 December 2003 597-607 <http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf>

Understanding Reliability and Validity in Qualitative Research

Nahid Golafshani

University of Toronto, Toronto, Ontario, Canada



Validity

The measuring device must measure what it's supposed to measure.

Internal validity

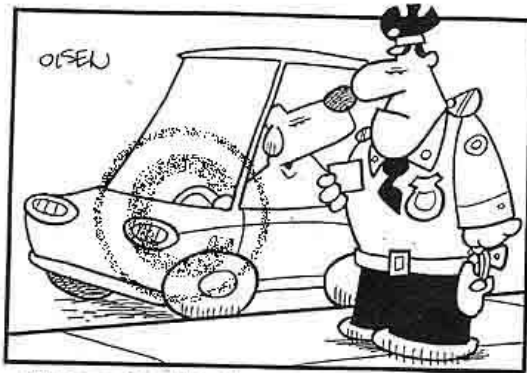
The extent to which the observed relationship reflects the actual relationship between the variables in a study.

External validity

The extent to which the results generalise to other participants and other situations

Student dissertations

Internal validity refers to (1) the rigor with which the study was conducted (e.g., the study's design, the care taken to conduct measurements, and decisions concerning what was and wasn't measured) and (2) the extent to which the designers of a study have taken into account alternative explanations for any causal relationships they explore (Huitt, 1998 cited in CSU).



"Of course it's valid, officer...don't forget, you have to multiply dogs years by seven!"

Reliability vs validity



**Reliable
Not Valid**



**Low Validity
Low Reliability**



**Not Reliable
Not Valid**



**Both Reliable
and Valid**

by Experiment-Resources.com

success at measuring what the researchers set out to measure.

(<http://writing.colostate.edu/guides/page.cfm?pageid=1386>, 2013)

Hierarchy of study design

- **Randomised controlled trial**
- **Non-randomised trial**
 - **Controlled trial**
 - **natural experiment**
 - **before and after study etc**
- **Cohort study**
- **Case control study**
- **Cross sectional study**
- **Ecological study**
- **Case series**
- **Case study/report**

Observational

Experimental

Analytical

Descriptive

What is a longitudinal study?

- Researchers in different fields use longitudinal studies to study changes in individual or group behaviour over an extended period of time by repeatedly monitoring the same subjects.
- In longitudinal research, results are in general recorded for the same group of subjects, referred to as a cohort, throughout the course of the study.

Don't Reinvent the Wheel

The importance of topic choice in graduate research projects

Seminar: Originality and topic choice



- Introduction
- Originality - 'Crave to be original
- Definition:
"not derived, copied, imitated or translated from anything else . . . novel, creative, independent in invention"
(Chambers Dictionary, 1990, p. 345)

A grasp of how research is done

- Imaginative
- Underestimate / overestimate
- 'workmanlike'
- 'Genius is 1% inspiration and 99% perspiration' Henry Ford
- Demonstrate: understanding of the wider academic debate within your 'field' and contribute to that 'field'
- Apprenticeship

Other considerations

- **Professional**
- **Independent critical thought is vital**
 - Developing a concept/method (need for a conceptual framework)
 - Think critically about your research
 - develop existing research
- **Does not require genius**

Types of topic chosen 1.

- Simplistic inductivism
 - traditional anthropologists
 - meaning would emerge
 - unstructured exposure
 - reality is not one object awaiting observation
 - 1. theoretical framework
 - 2. excuse for sloppy research
 - need to build cumulative bodies of knowledge

Types of topic chosen 2. & 3.

- **The 'Kitchen sink'**
 - broad topic
 - need for 'alot about a little'
- Grand theory
 - theoretical empires
 - “cobweb of verbiage”
 - stop reading (difficult)
 - theoretical fashions change
 - need to apply to the 'real world'

1. Solutions for simplistic inductivists

- Using sensitivities
 - your knowledge
 - history, culture, politics, context
- Using other researchers conclusions/theories/ classic research to generate research problem.
- Third variable

2. Solutions for ‘kitchen sinkers’

- “Do less, more thoroughly”
(Wolcott, 1990, p. 62)
- flow chart - conceptual frameworks
- puzzle
 - How or why did X develop (Developmental)
 - How does X work (Mechanical)
 - What causes X or what does X have on Y (Causal)

Continued

- The zoom lense
- Reductionism

3. Solutions for grand theorists

- Ignore fashions
- Find some data



Great Research Idea

- **School children science produces botany breakthrough at Aberystwyth**
- Nov 14 2008 by Hywel Trewyn, Daily Post
- AN EXPERIMENT with yoghurt pots and flowers conducted by schoolchildren was named among the “most important” published worldwide.
- Aberystwyth University scientist Dr John Warren noticed exposed coastal flowers had long stalks that could easily be damaged by the wind, while their related Alpine species tended to flower in cushions on the ground.
- He made the observation while on a beach for his 15-year-old daughter Eleanor’s birthday party at Ynyslas, near Borth.
- His research into the differences has been called a “plantlife evolutionary breakthrough” after he discovered the waviness of the coastal stalks is a factor in attracting pollinating insects.
- With the help of his children’s friends and two sixth-formers, Helen Cadwallader and Megan Hewitt of Newtown, Dr Warren conducted research on a shoestring by growing and comparing plants with stalks of various lengths, in his backyard in yoghurt pots from Rachel’s dairy in Aberystwyth.
- His paper, Do Flowers Wave to Attract Pollinators? appeared in the Journal of Evolutionary Biology and has attracted acclaim from the Smithsonian Magazine to local papers as far afield as St Helena, South Atlantic.

**ENERGY SAVING
CLIMATE CHANGE TIPS
FOR YOUR SCHOOL**

CANTEEN

CHOOSE FRIDGE
WITH A GOOD ENERGY
STAR RATING

MEATLESS
MONDAY!

HAVE ONE DAY
A WEEK THAT IS
VEGETARIAN DAY

USE LOCALLY
GROWN
PRODUCE

TRANSPORT

WALK

RIDE A BIKE

TAKE THE BUS
TO SCHOOL



WASTE

REDUCE
LUNCH TIME
RUBBISH



COMPOST

RECYCLE

WWW.WASTEWISE.WA.GOV.AU

LIGHTING

AT RECESS/
LUNCH

TURN OFF
LIGHTS



USE ENERGY
EFFICIENT LIGHTS

**HEATING
CONDITIONING**

ONLY USE HEATERS
WHEN THE SPACE
IS OCCUPIED



KEEP DOORS AND
WINDOWS CLOSED
WHEN HEATING OR
USING REFRIGERATIVE
AIRCONDITIONING



INSULATE
BUILDINGS

SET
THERMOSTAT
TO 18°C - 20°C
IN WINTER AND
26°C IN SUMMER



**OFFICE
EQUIPMENT**

TURN OFF
AT POWERPOINT
PHOTOCOPIERS,
COMPUTER PRINTERS
OUTSIDE SCHOOL
HOURS



**CHOOSING
EQUIPMENT**

LOOK FOR
A GOOD ENERGY
STAR RATING



TURN COMPUTER
OFF AT POWERPOINT
WHEN NOT IN USE



TURN OFF

**ORGANISATIONS
THAT CAN HELP**



FIELD OF MARS
ENVIRONMENTAL EDUCATION CENTRE
SCHOOL VISIT PROGRAM



SOLAR SCHOOLS PROGRAM

CONSIDER GOING
SOLAR FOR WATER
HEATING SYSTEMS



PUT TIMERS ON
URNS OR USE
A KETTLE



WATER HEATING



SOLAR SCHOOLS PROGRAM

NOTE: SCREENSAVERS
DO NOT SAVE ENERGY

Exercise

1. Produce a spider diagram of your research interests. Compare and contrast your diagram with a colleague. Refine your diagram in response to your discussion.

2. From this diagram formulate four research questions that your study aims to address. Begin each question with 'how', 'who', 'what', 'when' or 'why'?
 1. **Present diagrams next week**
3. Discuss the questions with a colleague and put them into a hierarchy of importance.
4. From this material, define an aim and specific objectives for your BA/BSc research.
5. If time permits, discuss ways in which these objectives may be achieved.
6. Present findings next week

Conclusion

The Review of Literature

Setting your work within an academic arena

The internet has changed the very meaning of 'research'.

Pew Internet and American Life Project (2013) Discuss

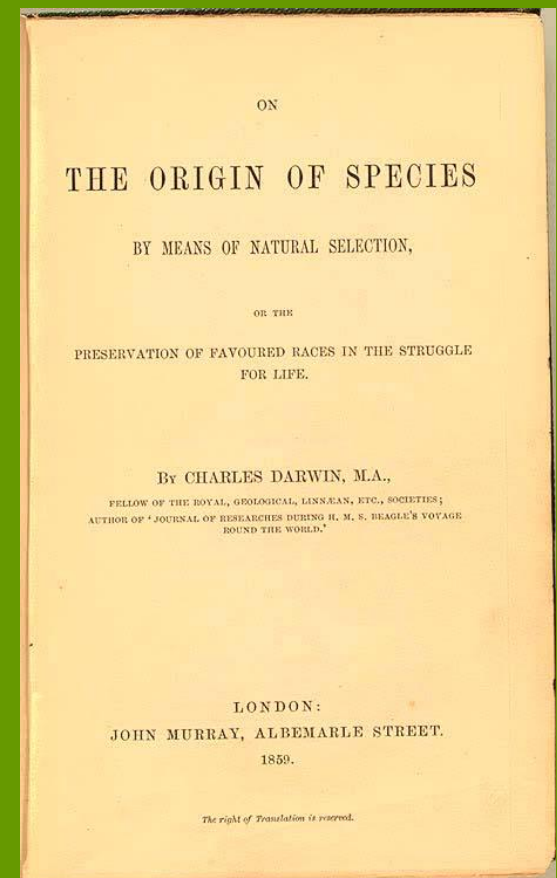
Purpose of Lit. Review

○Where do you begin?

- Stages
- Secondary
 - Primary

•Process

- Locating sources
- Critiquing literature
- Writing up



How do students research in the digital age?

The Pew report (2012) shows that the ease with which information “appears” online allows students to avoid any of the questions that may surface concerning the quality and intent of information they “research.” The Pew survey revealed that only one percent of those surveyed reported as “excellent” the ability of students “to recognize bias in online content.” As for their “ability to assess the quality and accuracy of information they find online,” only three percent reported that they found students to be “excellent.” (Turnitin, 2013: 4-5)

Furthermore:

1. Students appear to value immediacy over quality in online research,
2. There is an over reliance on the “wisdom of the crowd”
3. Student “research” is synonymous with “search”
4. Existing student source choices warrant a need for better search skills

DISCUSS

Source Educational Evaluation Rubric (SEER)

1. **Authority:** Is the site well regarded, cited, and written by experts in the field?
2. **Educational Value:** Does the site content help advance educational goals?
3. **Intent:** Is the site a well-respected source of content intended to inform users?
4. **Originality:** Is the site a source of original content and viewpoints?
5. **Quality:** Is the site highly vetted with good coverage of the topical area?



Turnitin, 2013: 6

The general aim and scope

○ Aim

- Broad understanding
- Help identify research questions
- Help develop methodology
- Varies between Qual. & Quant.

○ Scope

- No formula
- New areas of research
- Traditional areas of research



British Ecological Society
Conservation Ecology Group

Be logical and systematic

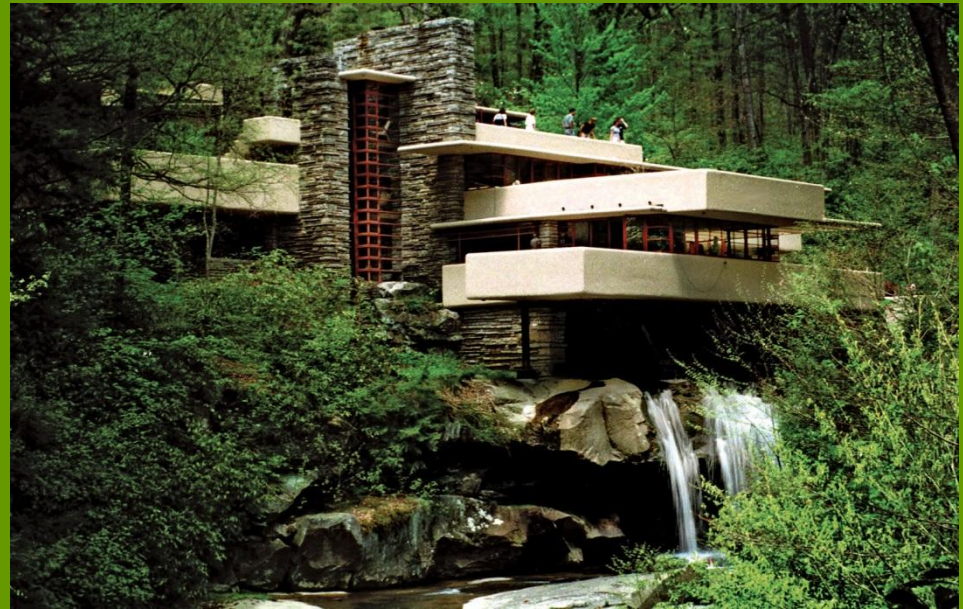
- Start with recent articles (work backwards)
- Check abstract/summary
- Record (VITAL)
 - Index cards
 - referencing details
 - main points / results / methods
 - additional refs
 - colour coding
 - location (classmark)

Finding the literature

- Check your time frame
- College library
 - ILL
 - Science Direct
- Using Social studies abstracts/indexes
- Checklist / key words
- Computer search
 - BIDDS
- Check for theoretical and empirical sources

Doing the literature review

- **Reading**
 - Skimming
 - Comprehending sources
 - Analysing sources
 - Synthesis (to produce main themes, directions and contradictions)



Writing up

- Outline the topic- e.g.. Hist., subject area
- Briefly explain how the material was selected
- Describe the work that has been done
 - Critical (where appropriate)
 - Summarise and synthesise the main directions / contradictions
 - Balanced
 - Note methods and results used
 - Note areas not adequately covered

A good literature review should be characterised by: (Wood, 1994)

- Purposes of a review being accomplished
- Evidence of a critique (analysis and synthesis)
- Primary sources
- Number of references used
- Paraphrase or even better summarise rather than quote (Carroll, 2013)
- Logical



Conclusion

- A literature review is a piece of evaluative and interpretive prose, not a list describing or summarising one piece of literature after another (Gammon, 2012)

- Synthesise and evaluate in relation to your conceptual framework.



- **Using hand-outs (1. how to do reviews, 2. An article relevant to your other modules) review this article: Capacity for (Co)Management of Marine Protected Areas in the Caribbean, PATRICK McCONNEY AND MARIA PENA**

How to Choose a Suitable Methodology

“Knowing what you want to find out leads inexorably to the question of how you will get the information.” (Miles & Huberman, 1984, p. 42)

- Reflect overall research strategy (Mason, 1996)
- What is a research strategy?
- Action research, case studies, experiments, surveys (Robson, 1993)

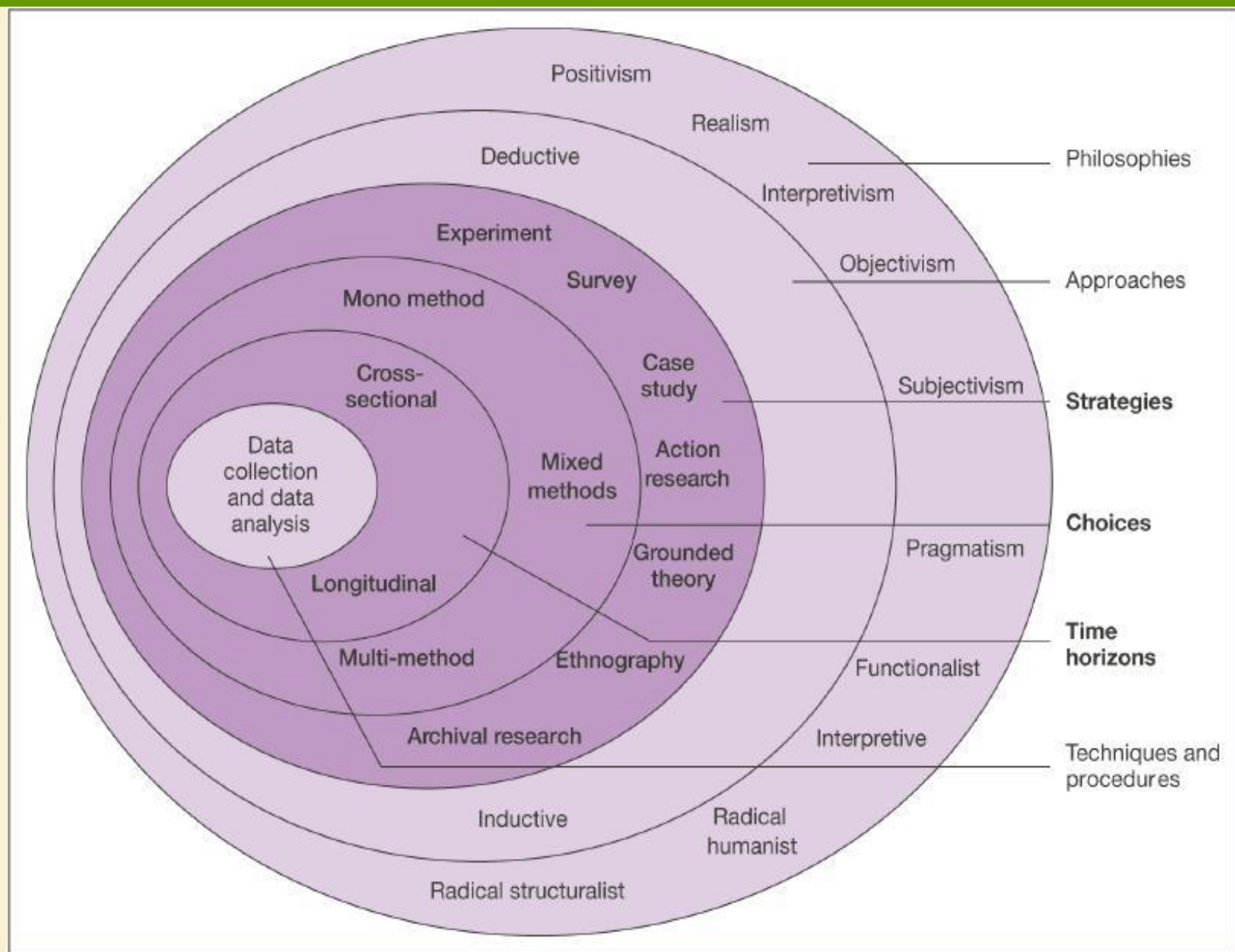
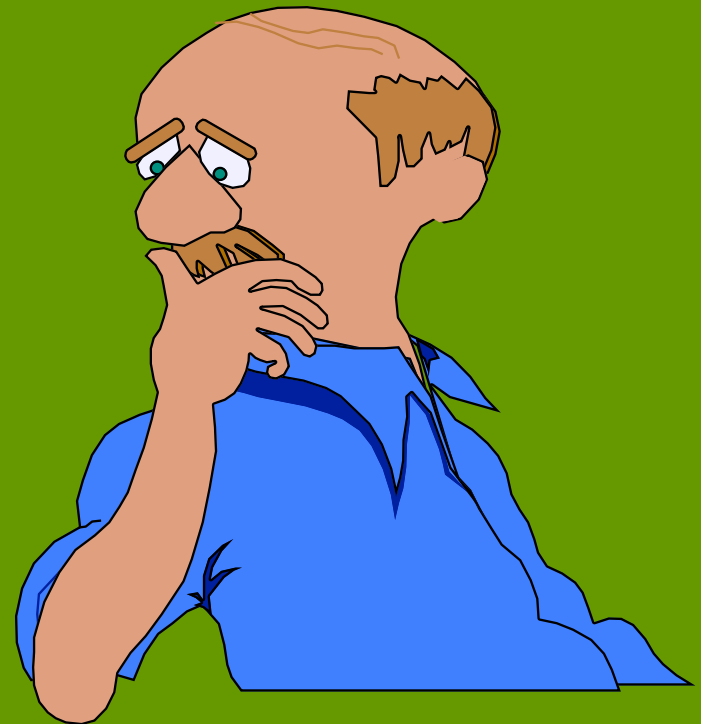


Figure 5.1 The research 'onion'

Wide variety of methods available. How to decide? Blaxter et. al. (1997)

- Research Families
- Research Strategies
- Research techniques



Research Families

- Quantitative
OR
- Qualitative
- Office based
OR
- Fieldwork
- Combination

Research Strategies and Techniques

Strategies

- Action research
- Case study
- Experimentation
- Surveys
- Ethnographic

Techniques

- Documentation / Archive
- Interviews
- Observation
- Questionnaires

Action research

- Initiated by Kurt Lewin (1946) MIT
- Action research involves the process of actively participating in an organization change situation whilst conducting research. (Wikipedia, 2013)
- “Action research is simply a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out”
 - (Carr and Kemmis 1986: 162 cited in <http://www.infed.org/research/b-actres.htm> 2013).
- Declined in importance in the 60s but become increasingly important in recent research (Stringer, 2007)

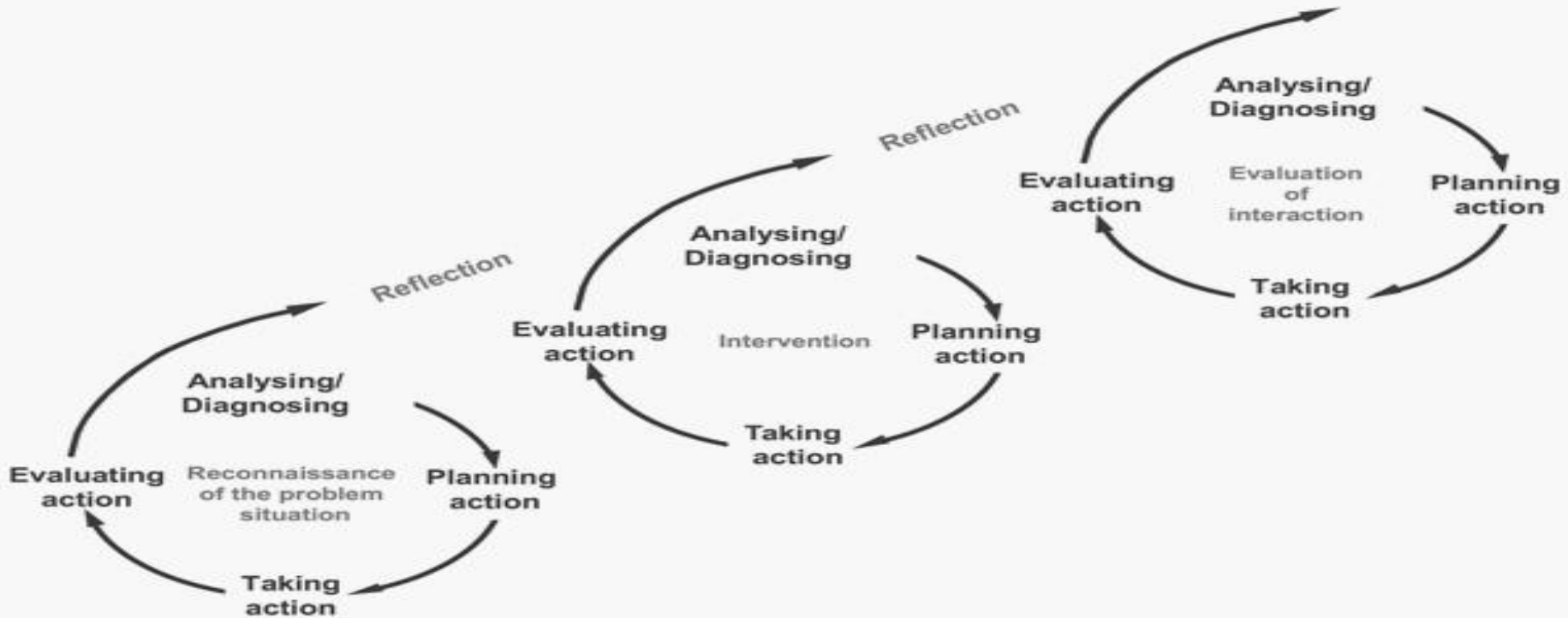
Action Research cont'd

- Action research starts with an idea to solve or improve something. This idea is from a real life situation and will have real life benefits and applications.
- The people who have formed the idea are then also the people to test it and participate in the research.
- The research then follows a cycle, in which the idea is planned, put into action, monitored, analysed, and evaluated.

<http://www.thereadingrhizome.com/?p=133> (2013)



Action Research Spiral



Source: Adapted from Coghlan and Brannick (2001), p. 19; Cardno and Piggot-Irvine (1996), p. 19

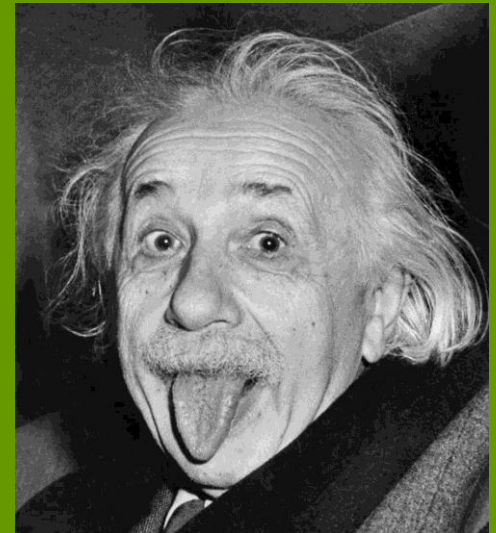
1. Johnson, A. P. (2007) *A short guide to action research*.
2. Smith, M. K. (2013) 'Action research', *the encyclopedia of informal education*, www.infed.org/research/b-actres.htm.
3. Stringer, E. T. (2007) *Action Research: A handbook for practitioners*

Case study

- A case study is an in-depth study of a particular subject or aspect of that subject (Gillham 2000)
- Woodside (2010) and Yin (2006) point out that a case study enables a researcher to focus on the minute detail of the subject
- Gillham (2000) states that, a case study can be conducted by a single researcher
- Woodside (2010) adds that the researcher is not reliant on a third party, whereas in a survey the survey is dependent on getting a sufficient number of people to take part in the survey. Therefore the researcher has a measure of control over the collection of data
- However, White (2002) warns that for the case study to be relevant to the research question, the researcher must choose a case that is typical

Experimentation

- Scientific method (Bacon, 1620) But initiated in the Middle East
- An **experiment** is an orderly procedure carried out with the goal of verifying, falsifying, or establishing the validity of a hypothesis. Experiments provide insight into causal links/effects by demonstrating what outcome occurs when a particular factor is manipulated. (Wikipedia, 2013)
 - Tests existing theories
 - Usually applies an empirical methodology
 - Tests an hypothesis
 - Replication, e.g. Clinical trails
- *No amount of experimentation can ever prove me right; but a single experiment can prove me wrong (Einstein)*



Survey



- Collects data about a population generally through sampling
- Fink (2003) points out that a survey enables a researcher to pose questions that are specific to the dissertation question.
- White (2002) adds that a survey can be used to deliver a large volume of data for analysis but is dependent on the sample size, individual knowledge and sample representation of the research population.
- Biggam (2011) states that it is a feasible method of researching a dissertation topic.
- Fowler (1995) warn that the value of a survey is linked to the type of questions asked and the format of those questions and suggests that this method requires clarity of the survey objectives and suggests that an inexperienced researcher could add bias to the data collected.

Ethnographic research

- Originating in anthropology, this term traditionally refers to a practice in which researchers spend long periods living within a culture in order to study it.
 - (<http://www.aqr.org.uk/glossary/?term=ethnography> 2013)
- Therefore research is in a groups 'own environment'
- Time consuming but produces great detail
- Normally researching socially produced 'answers'

Purposes of Research (Robson, 1995)

- **Exploratory**

- To find out what is happening
- To seek new insights
- To ask questions
- To assess phenomena in an original way
- Usually, but not necessarily, qualitative

Purposes Continued

- **Descriptive**

- To produce an accurate profile of persons, events or situations
- Requires extensive knowledge of the situation so that appropriate information can be collected
- Qualitative and / or quantitative

- **Explanatory**

- Seeks an explanation of problem or situation (causal relationships)
- Qualitative and / or quantitative

Purposes Assist in Strategy Choice

- Case studies - exploratory
- Surveys - descriptive
- Experiments - explanatory
- EACH strategy can be used for any of the noted purposes

Considerations

- Validity and Reliability
- Objectivity and Truth
- Sampling
- Ask yourself
 - What methods are available?
 - What can they tell me?
 - Which is appropriate / practical
- Conclusion

Questionnaire Design:

Is there a need for careful consideration?

Introduction

- Extensive
- Obvious strategy
- Not simple
- Consider
 - Formulation
 - I. First thought Qs
 - II. Final questionnaire
 - III. Wording of final questionnaire
 - Implementation
 - Administration
 - Analysis

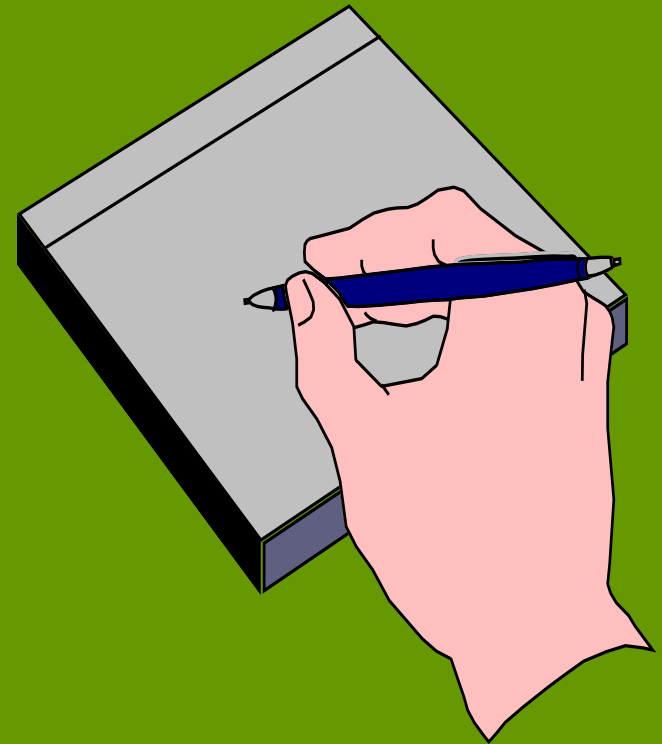
Which to Choose?

- Telephone
- Face to face
- Posted
- E Mail
- Survey Monkey
- Video Conferencing etc..
- All have:
 - advantages
 - disadvantages



Which Type of Question?

- **Blaxter et. al. 1996, p. 161**
 - Quantity or Information
 - Category
 - List / Multiple choice
 - Scale
 - Ranking
 - Table
 - Open ended



Self Completed

○ **Why chosen?**

- Interviews (Next week)
- Efficient
- Coding (Computer)
- Widely used (Govt.)

○ **Problems**

- Superficial
- Honesty / checks
- Predetermined definitions
- Cost
- Wording
- Interpretation

Designing Self-completed

- **Specific Q's are more useful than general:**
 - List the TV programmes you watched yesterday? (*General*)
 - Which of these programmes did you watch (list) (*Specific*)
- **Closed Q's should dominate**
 - Coding
 - But not sensitive

Designing Self-completed Cont'd

- **Offer a no opinion option**
- **Measurement of intensity**
 - Strongly etc..
 - OR Extremely Strongly 12. . . 567 Not at all
- **Use forced choice rather than agree/disagree**
- **Question choice**
- **Wording**

The Need for a Good Response

- **Appearance**
 - Easy to complete
 - Space for Q's & Ans..
- **Clarity**
 - Wording / Simplicity
 - Instructions
- **Co-operation**
 - Interpose attitude Q's / vary response
- **Q. become less reliable and beneficial if they become tired/distracted from the Q. (Bachman, 1981; Galesic & Bosnjak, 2009)**

The Importance of Organisation

- **Design**

- Colored pages
- Ticks
- Sub - lettering
- Start easy / End interesting
- Pilot / wording
- Final Thank you / return

- **Cover letter**

- Aim / significance
- Confidential
- Reply / organisation

- **Mailing**

- Typed and addressed (Name)
- Stamped addressed env.
- Thurs: Home, Mon: Work
- Seasonality

- **Follow-up / Incentive**

- Reminders
- Prize draw

Coding and Analysis

- **Coding**
- **Identify responses**
 - Closed
 - Open
- **Analysis**
- **Conclusion**



Interview Design

The only way to find ‘true’ social data?

“Interviews are encounters between a researcher and a respondent in which the latter is asked a series of q’s relevant to the subject of the research. The respondent’s answers constitute the raw data analysed at a later point in time by the researcher.”

(Ackroyd & Hughes, 1983, p.66)

Ask yourself

- Which research objectives or hypotheses is the question related to?
- Can the answer be obtained from other sources (Naoum, 2013)
- Is the questions based on or facilitated by the literature review?
- How can I present and evaluate the data?

Pilot questionnaire/interview

- Ask
 - How long did it take to complete
 - Instructions clear?
 - Layout
- Will it give you the data to answer 'YOUR' objectives?
- How can I analyse the data?
- Try to analyse the data.

Types of Interview

○ **Structured**

- comparability
- representative
- non-directive q's
- need to be from similar culture
- pilot /preparation
- appearance / approach
- q's & answer recording



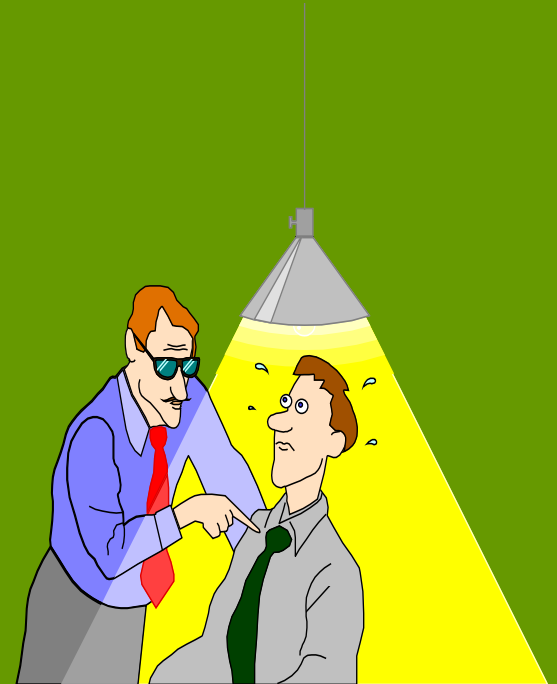
Types cont'd

○ **Semi-structured**

- specific q's
- elaboration/clarification
- answer 'own terms'
- check interviewers influence

○ **Focused or informal**

- open ended
- challenge researchers pre conceptions
- 'own frames of reference'
- flexibility & 'meaning'



Types cont'd

- **Group**

- norms and dynamics
- chair / organiser
- balance
- > & < expression of feelings
- modified responses

- **Telephone**

- **Ethnographic**

- **Survey Monkey**

- How to use survey monkey? 16mins



Covering letter

- Identify organisation
- Purpose of research
- Why it is important to answer the Q.
- Assure strict confidence

(Nachmias cited in Naoum, 2013)

Advantages & Disadvantages

- Flexible and adaptable
- Reliability
- Professionalism
- Help understand complex social interactions
- Time / permission / arrangements / travel etc..
- Practicalities of obtaining interviewees
- Acceptance in the 'community'

Some Considerations

- **Closed / open / scale**
- **Probes**
 - silence, enquiring glance, your personal view
- **Prompts**
 - e.g.. pictures, names
- **Order**
 - 1. Intro., 2. 'warm - up' non threatening,
 - 3. 'real', 4. 'cool - off', 5. end.

Analysis, Validity, Ethics

- What status do you attach to your data?
- Is your analytical position appropriate to your practical concern?
- Does the data address your research topic?
- Are you proposing extensive claims of your findings?
- You need to go beyond a list.

Conclusion

Other Forms of Data

‘Is there method in the madness?’

- Variety avail.

- Additional Methods

- Official Statistics

- Documentary

- Observation

- Other

- Mixed Method

Official Statistics

- Demographic Characteristics
- Huge Volume
- Limitations
 - Unexpected assumptions
 - Interests
 - How constructed
- Sources
 - Regular
 - One off



Some Official Stat. Considerations

- Understand the dynamics and trends in society
- Schools of thought on usefulness
- Note
 - Type of Off. Stat.
 - Aim of the Off. Stat.
- Process ----- Product Interlinked



Documentary Evidence

- Tells us the practical & political of the period (Hakim, 1987)
- 'Impressionistic
- Sources

Hist. Archives

Laws

Biographies

Reports

Hansard

Media

Maps

Drawings

etc..

Documentary Cont'd

- Unobtrusive Methods
 - Physical Traces (*Sherlock*)
 - Erosion (floor tiles)
 - Accretion (Deposits)
- Authenticity, representative, credibility, meaning
- Analysis
 - Content Analysis
 - Quantitative or Qualitative

Observation

- Participant
- Structured
- Advantages
- Disadvantage
- Approaches
 - Narrative (classic anthropological)
 - Coded
- Observational bias

Other Methods

- Role play (Cohen)
- Meta analysis
- Feminist
- Psychometric
 - 'Off the shelf'
- Mixed methods (Robson + Silverman -)

Some Practical Issues



- **Loneliness**
- **Obsessiveness**
- **Enjoy**
- **When to stop.**
- **Ethics**

Conclusion

Research Analysis / Evaluation: The tip of the iceberg

“Analysis is about the search for explanation and understanding, in the course of which concepts and theories are likely to be advanced, considered and developed.” (Blaxter *et. al.*, 1997, p. 185)

- Data Management coding & summarising
- Analysis- Qual. & Quant.
- Interpretation- contextualise

How, where, when and type?

- *Cook* Your data
- Organised vs. unorganised
- Perceptions
- Resources available
- Data varies



Qualitative and Quantitative

- Major consideration for analysis
- “Neither are ‘facts’ in anything but a very subjective sense” (*ibid.*, p. 177)
- Qual can be Quantified and vice versa
- ALL data needs to be representative, reliable and accurate. **KNOW YOUR SOURCES**
- Trace your data to their origins

Data Management

- Reduce the quantity and scope
- Abstract from the data the relevant points.
- Loss of info.
- Subjective
- **Techniques**
 - Coding
 - coding instructions
 - computer
 - cleaning data
 - Annotation
 - Labelling
 - Selection
 - Summary

Analysing different forms of data

- RIGOROUS PROCESS
- **Documents**
 - need to be critically assessed (Not face value)
 - Relate to other documents (Comparative)
 - Abstract relevance to your research
- **Interviews**
 - Context
 - Important statements / filter
 - Computer analysis codes/word search

Cont'd

Observation

- Shoes
- Different interpretations

○ **Questionnaires**

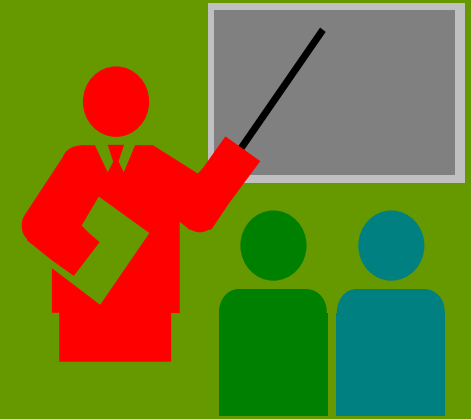
- More Quant.
- Codes -Mutually exclusive & Consistent

Statistical Analysis

- **Types**
- **Descriptive Statistics**
 - Variables, frequencies, ranges
 - Simple
- **Inferential**
 - Similarity e.g. Chi Square (Assumptions)
 - more variables e.g Multiple regression
- **Check Causality** - Find the relationship

Interpretation

- Meaning to data
- Need to recognise the limitations of your interpretation
- Relate to the wider academic debate. Agree or not
- Different to Lit. Why?
- How can it be developed further?



Conclusion

- Validity (Silverman, 2000)
- Reliability
- Significance
- Representative



It's More Than Just Reading A Book

Analysis Of Qualitative Data



What Is Qualitative Research?

Why Do It?!

- Generation of data which aim to explore, describe and contextualise experience (Henwood and Pidgeon 1992)
- Good at answering 'How?' and 'What?' questions
- Based on methods which involve appreciation of complexity and detail (Mason 1996)

Stage 1. Make Your Data 'Analysis Friendly'

- Turn data into text using word processing package eg transcripts, fieldnotes/memos/research diary, documents
- Ensure you can trace where excerpts of text are from (eg carefully labelled with identifier for participant/focus group, dated, backed up)
- Ensure text is easy to read and code (font size, spacing, margins, single sided sheets)

Stage 2. Decide On Tools To Help You With Analysis

- By hand
 - eg pencil and paper
 - eg scissors and folders
- By computer
 - eg word processing package
 - eg Ethnograph

Stage 3. Deal With Demographic Data

- Most qualitative studies include some quantitative data (eg age, gender)
- Interval/ratio data (eg age):
mean/median, range, standard deviation
- Nominal data (eg gender, grade,):
mode, frequencies
- Think about how best to display this data (eg table, bar chart, pie chart)

Stage 4. Carry Out Your Qualitative Analysis

- Content analysis
- Thematic analysis
- (Analysis of focus group data)
- 'Methodology specific analyses' eg discourse analysis, grounded theory, narrative analysis

A. Content Analysis

WHAT IS IT?

- Sections of text classified into a number of content categories
- Summarises data
- Can be done through counting OR textual analysis
- Usually seen as realist/positivist type of research (so not good/useful in some circumstances eg unique experience/perspective/context)

A. Content Analysis

HOW DO YOU DO IT? (after Robson 2013)

- Generate data (usually observation, analysis of documentation or questionnaires)
- Choose recording unit of analysis (ie use of individual word or phrase, or semantic ['meaning'] category)
- Select categories for analysis (usually subject matter).
- State explicitly what you are looking for in making categorisations (ie define categories)
- Read through one or two documents. Note in margin where categories occur

Content Analysis (Cont.)

HOW DO YOU DO IT? Read a few more documents. Review choice of categories. Think about: similar, irrelevant and important categories

- Think about how to demonstrate rigour in your choice of categories and coding (eg reliability)
- Produce 'master' list of categories
- Look for and mark all occurrences of categories in your data
- Collect together in different files all incidences of your codes, either using photocopies and scissors, or word processing files.
- Either I) count (if interested in occurrence or number of people using it) or II) look at range/type of examples (if interested in breadth, illustrative examples)

A. Content Analysis: Pros And Cons

PROS

- Quick
- Relatively easy
- Obvious and easy to follow

CONS

- Superficial and uninteresting
- Doesn't relate to/use theory
- 'Codified common sense' (Robson 2013: 275) (so doesn't permit multiple perspectives)

B. Thematic Analysis

WHAT IS IT?

- Describes and organises data
- Driven by theory (deductive) or data (inductive)
- Generic term used within many different types of qualitative analytic approaches
- Can sit anywhere along the 'positivist/relativist' continuum

B. Thematic Analysis

HOW DO YOU DO IT? (after Smith 1995)

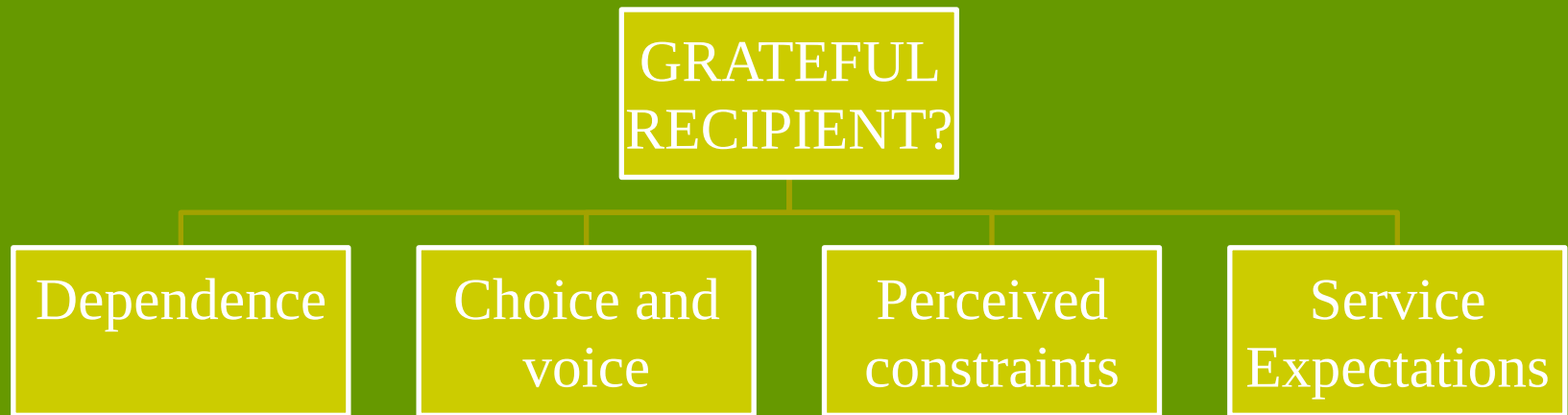
- Generate data (typically ssi, focus group)
- Read one transcript a number of times. In right margin, note: interesting things, significant things, associations, summaries
- Note (in left margin) key words, emerging code titles
- Look at emerging codes and think about: similarities and connections, master or subordinate codes, irrelevancies, new or more important ideas emerging from existing codes
- Produce master list of codes
- Move to next transcript. Either a) continue working with master list, adding to and generating new codes or b) produce new master list, read together with previous list and produce consolidated list

B. Thematic Analysis (Cont.)

HOW DO YOU DO IT? (after Smith 1995)

- After five or six transcripts: identify themes (more abstract/theoretical), revise previous transcripts and analyse additional transcripts
- Collect together in difference files all occurrences of your (codes?)/themes
- Re-read data by theme, compare and refine themes. Produce definitive list of themes (as previously)
- Carefully define and note down what you mean by each theme
- Think about how you will demonstrate rigour in your analysis (eg reliability, dependability, plausibility, reflexivity)

Example Of Codes (Categories) Combining To Form Theme



B. Thematic Analysis: Pros And Cons

PROS

- Provides meaning and organisational structure
- Rich, insightful, interesting, complex
- Based in theoretical approach
- Basis of theory generation

CONS

- Time consuming
- Reliability/dependability/plausibility may be difficult to demonstrate
- Data may be too brief/superficial to support it

Criteria For Demonstrating Rigour In Qualitative Research

POSITIVIST	NATURALISTIC (Guba and Lincoln 1982, Lincoln and Guba 1985)	POST - MODERN
Internal validity	Credibility	Eg Clear rationale for method, sample and analysis Reflexivity (see Finlay 1998) Plausibility Accounts for volume and detail of data (see Yardley 2000)
External validity	Transferability	
Reliability	Dependability	
Objectivity	Confirmability	

Common Difficulties/ Problems ...

- Can't find in books 'How to do it'
- Underestimate how long it takes to turn tape-recorded data into text
- time to analyse properly
- Completed analysis i) seems like common sense or ii) feels like it is invented

... And Some Solutions!!

-
- Clarify what you understand by your qualitative research approach (using references), and state clearly what you did
 - Allow plenty of time for all parts of research process (eg 1:8 for transcribing)
 - Don't spend all your time transcribing to detriment of analysis. Recognise this requires focused time, and work through difficulties!
 - Think about how you can show that you have done your research rigorously and carefully

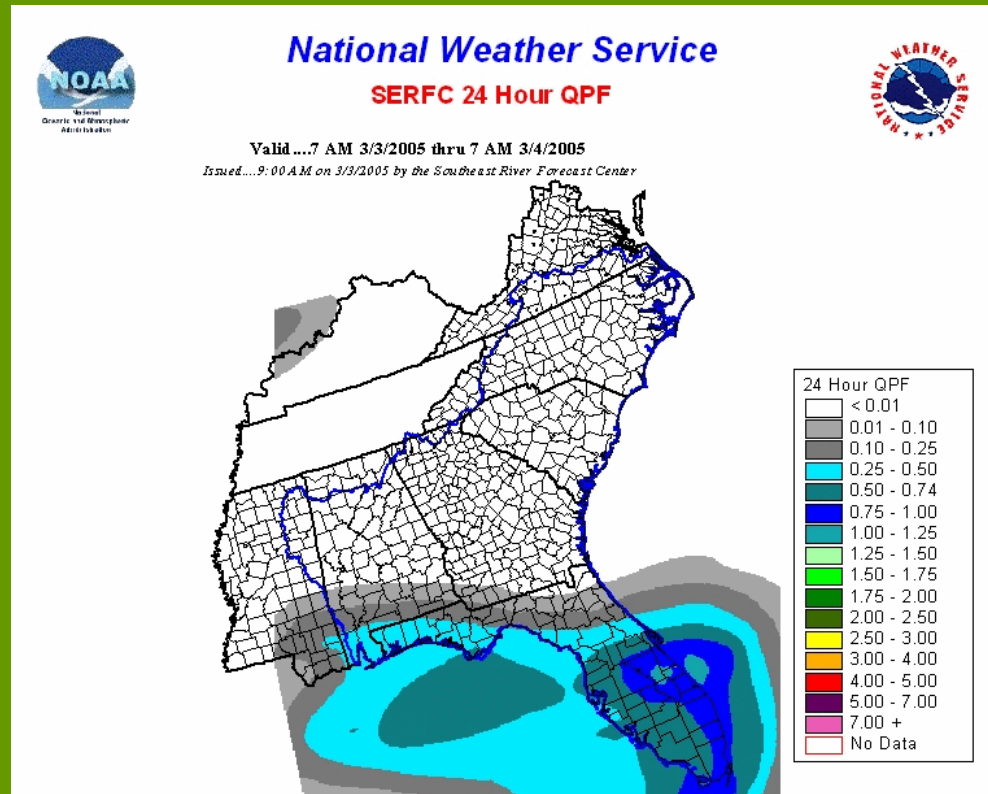
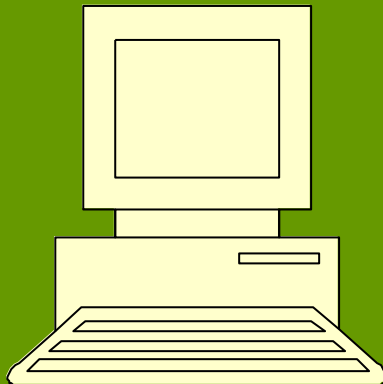
Software can help!

- E.g. MAXQDA
- MAXQDA is a professional software for qualitative and mixed methods data analysis
- Overview (START VIRTUAL TOUR)
 - <http://www.maxqda.com/products/what-is-maxqda>
 - Go onto the web site and highlight how it could be used in Env. Con. Dissertations.
- Used in various research projects e.g. Cent et. al. (2013) in their work entitled *Roles and impacts of NGO's in Natura 2000 implementation in Hungary and Poland* in the Journal Environmental Conservation (40 (2): 119-128)



It's more than just counting

Analysis of Quantitative Data



Coding

- Code: numbers or letters assigned to an observation of a variable
- **Numeric variables** - “values”; Quantitative
- **Alphanumeric (string) variables** - labels
- **Missing values** - no response to an item
- Dichotomous data: 0 1

Considerations in Choosing Statistical Analysis

- Level of measurement of data collected (nominal, ordinal, interval, ratio)
- Goals of data analysis:
 - Descriptive statistics: procedures that assist in organizing, summarizing and interpreting data
 - Inferential statistics: Procedures that allow one to make generalizations from a sample to the larger population
- Audience – For whom is the analysis intended?

More Considerations

- Number of variables to be analysed
- Univariate statistics: Only one variable; Descriptive
 - Measures of Central Tendency
 - Frequencies/Percents
 - Measures of Dispersion
- Bivariate statistics: Analysis of 2 variables
 - Measures of Association
 - Cross tabulations
 - Comparison of Means
- Multivariate statistics: Analysis of 3 or more variables

Univariate Analysis

- Frequency tables
- Measures of central tendency:
 - Arithmetic mean
 - Median
 - Mode
- Diagrams:
 - Bar charts
 - Pie charts
 - Histograms
- Measures of dispersion:
 - Range
 - Standard deviation

Bivariate Analysis

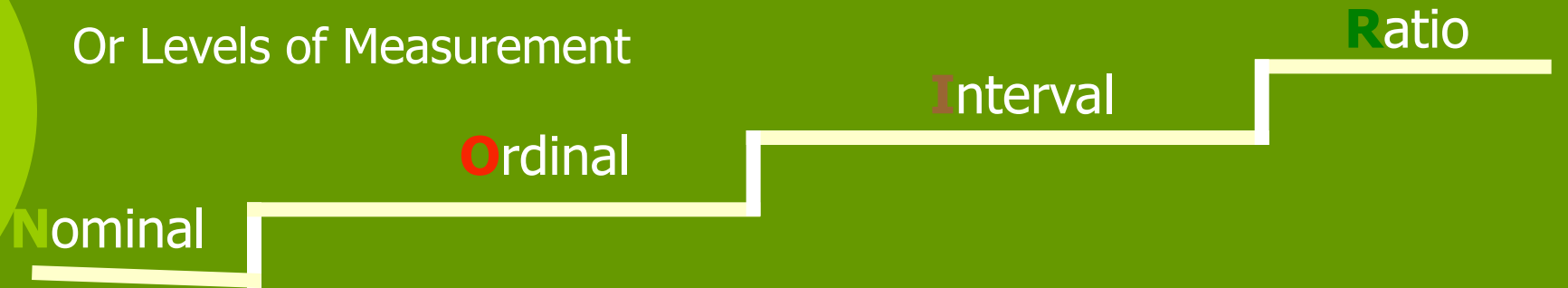
- Contingency tables
- Pearson's r
- Spearman's rho
- Phi and Cramér's V
- Comparing means

Levels of Measurement

- Nominal measures – classify observations into mutually exclusive categories
- Ordinal measures – mutually exclusive, with a fixed order (ranked)
- Interval measures – mutually exclusive, with a fixed order and equal spacing between categories.
- Ratio measures – all of the above with an absolute zero point

Measurement Scale

Or Levels of Measurement



N

Numbers assigned to categories

O

"

+

Numbers ranked-ordered

I

"

+

"

+

Equal intervals between numbers

R

"

+

"

+

"

Numbers expressed as ratios

Descriptive Statistics

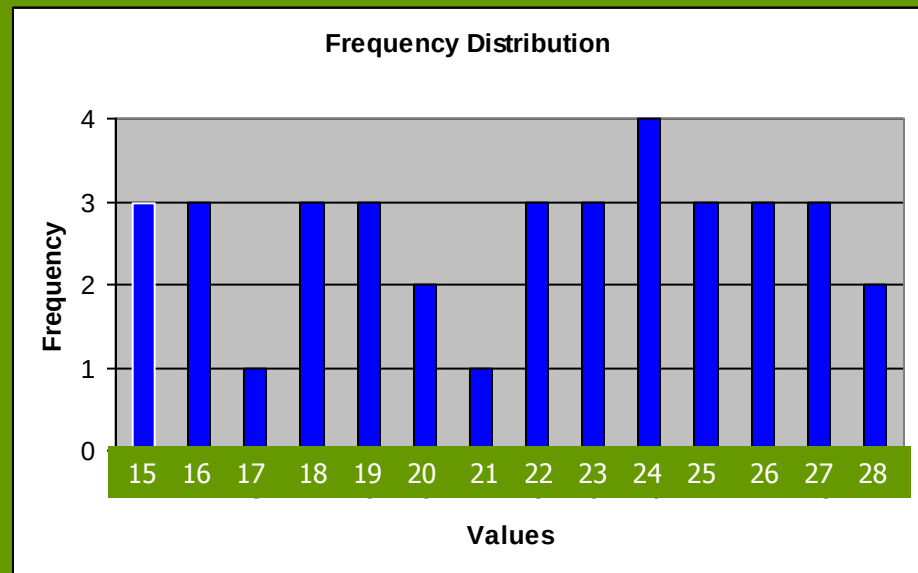
Descriptive Statistics: Used to help describe a group of numbers

What can we say about the following set of numbers?

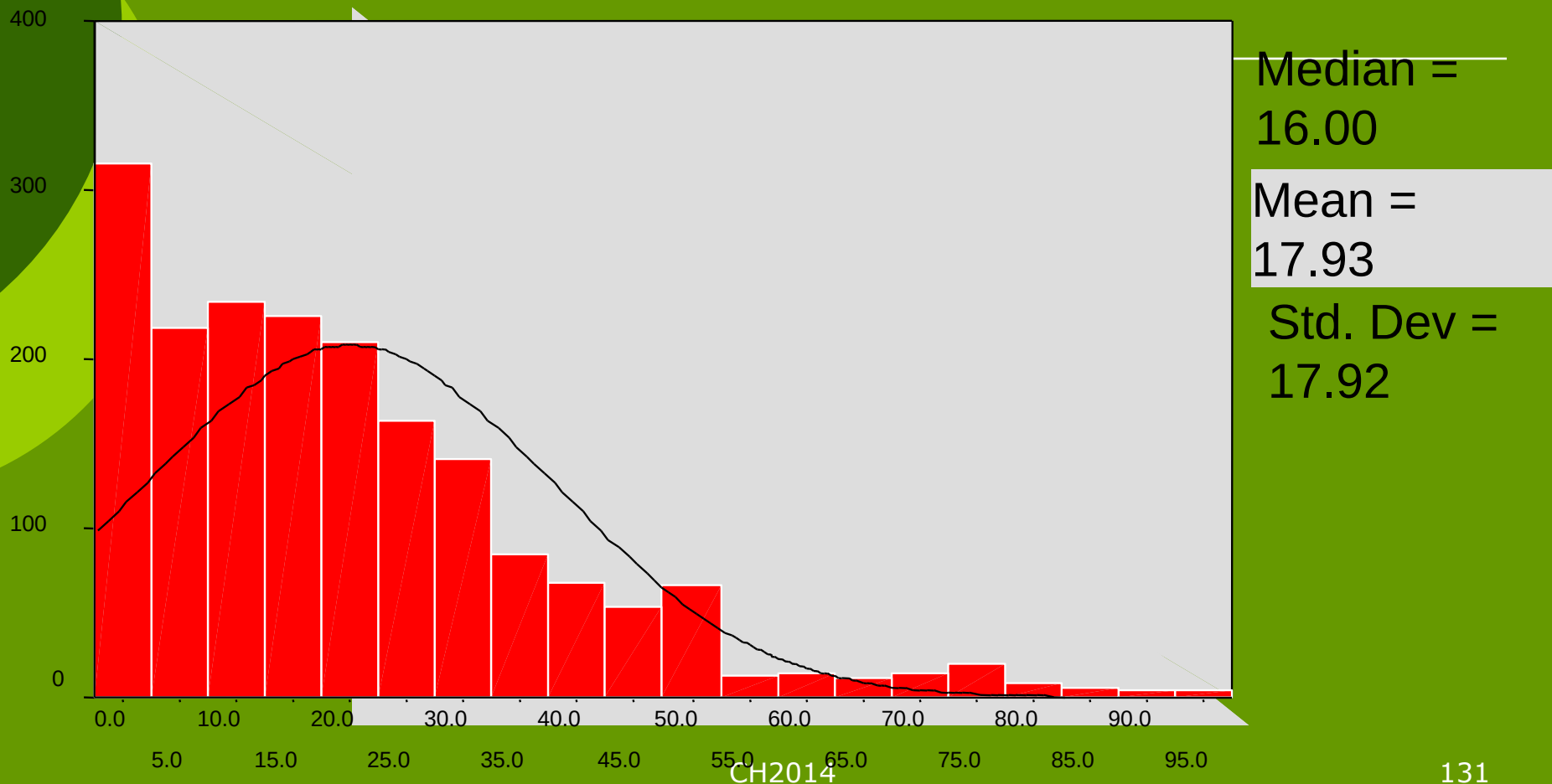
15 24 28 25 18 24 27 16 20 22 23 18 22 28 19 16 22 26
15 26 24 21 19 27 16 23 26 25 18 27 17 20 19 25 23

**Frequency
distribution:**

It will indicate how often each score is obtained



Distribution of Freshwater Crayfish from source of Teifi (2005)(N=1873)



Measures of Central Tendency

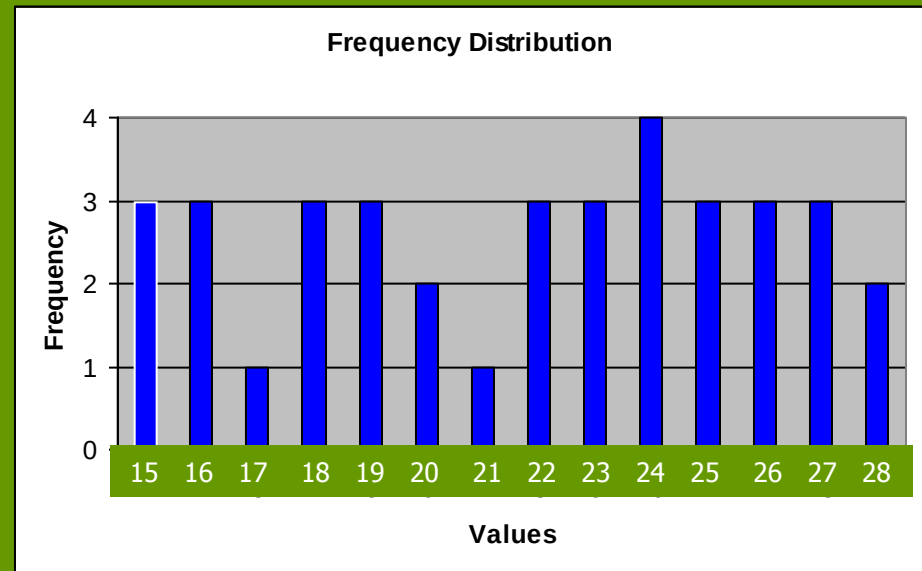
Mode: "Score that occurs most frequently"

Median: "Score in the middle of the distribution"

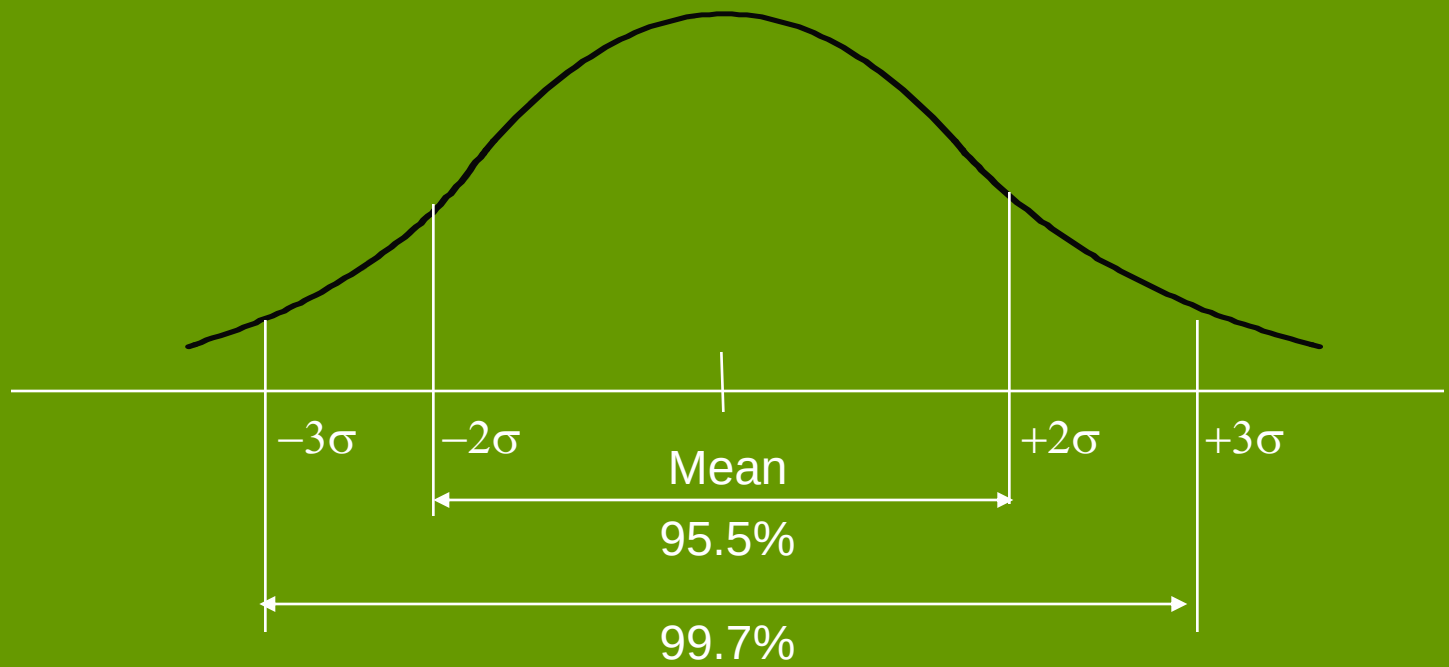
Mean: "Arithmetic average of all scores"

15	24	28	25	18	24	27
16	20	22	23	18	22	28
19	16	22	26	15	26	24
21	19	27	16	23	26	25
18	27	17	20	19	25	23

Mode:	Median:	Mean:
25	22.5	21.91



The role of Central tendency and Deviation



Measures of Central Tendency

- **Mean:** Average – sum all values in distribution and divide by number of cases
- **Median:** Midpoint of a distribution; 50% of observations above & 50% below. Stable even in presence of extreme scores
- **Mode:** Largest number of cases; may be bimodal

Measures of Dispersion

- Standard deviation
- Variance
- Range
- Whereas measures of central tendency show what the “centre” of the data looks like, measures of dispersion show what the data looks like on the whole. They describe the “spread” of data.

Measures of Dispersion

- Standard deviation is the average distance between the case values and the mean.
- A large standard deviation indicates that there is a wide range. A small SD indicates a small range.
- To calculate the standard deviation, you can take the differences between individual case values and the mean, then square those differences. Then, take the square root of the SUM of the squared differences divided by N.

Range: "Difference between the highest and lowest score" $(28-15) = 13$

Standard Deviation: "Average distance of the scores from the mean" $SD=4$

**Symmetrical
Distribution**



(mean, median, mode)

Positive Skew



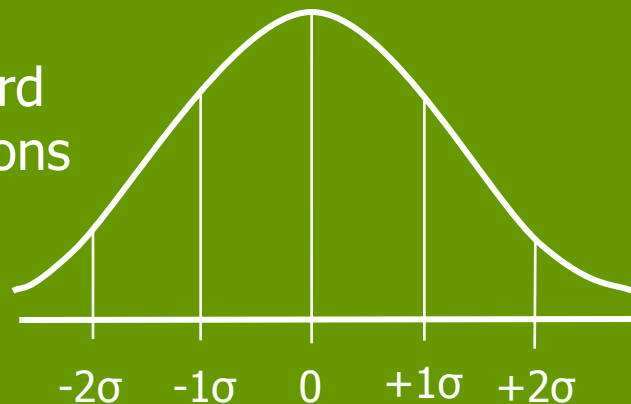
(mode, median, mean)

Negative Skew



(mean, median, mode)

**Standard
deviations**



$$\sigma = \sqrt{\frac{\sum (x - M)^2}{N}}$$

x = individual scores

M = mean

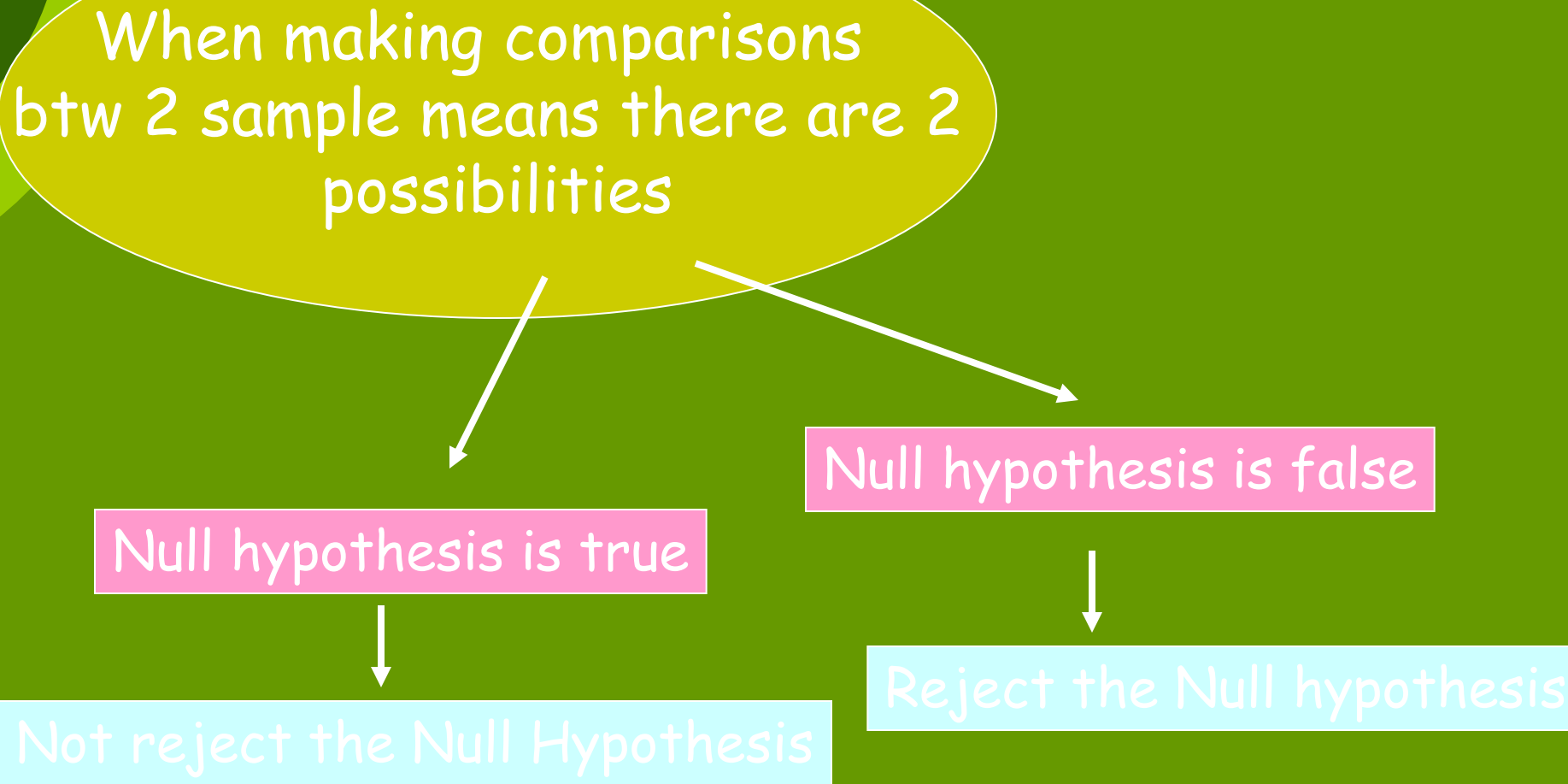
N = number of scores in group

Inferential Statistics

- Used to infer population characteristics from sample data
 - Estimation
 - Hypothesis testing
- Univariate
 - One dependent variable
- Multivariate
 - More than one dependent variable
- Parametric vs. nonparametric analyses

Inferential Statistics

When making comparisons
btw 2 sample means there are 2
possibilities



```
graph TD; A([When making comparisons btw 2 sample means there are 2 possibilities]) --> B[Null hypothesis is true]; A --> C[Null hypothesis is false]; B --> D[Not reject the Null Hypothesis]; C --> E[Reject the Null hypothesis];
```

Null hypothesis is true

Not reject the Null Hypothesis

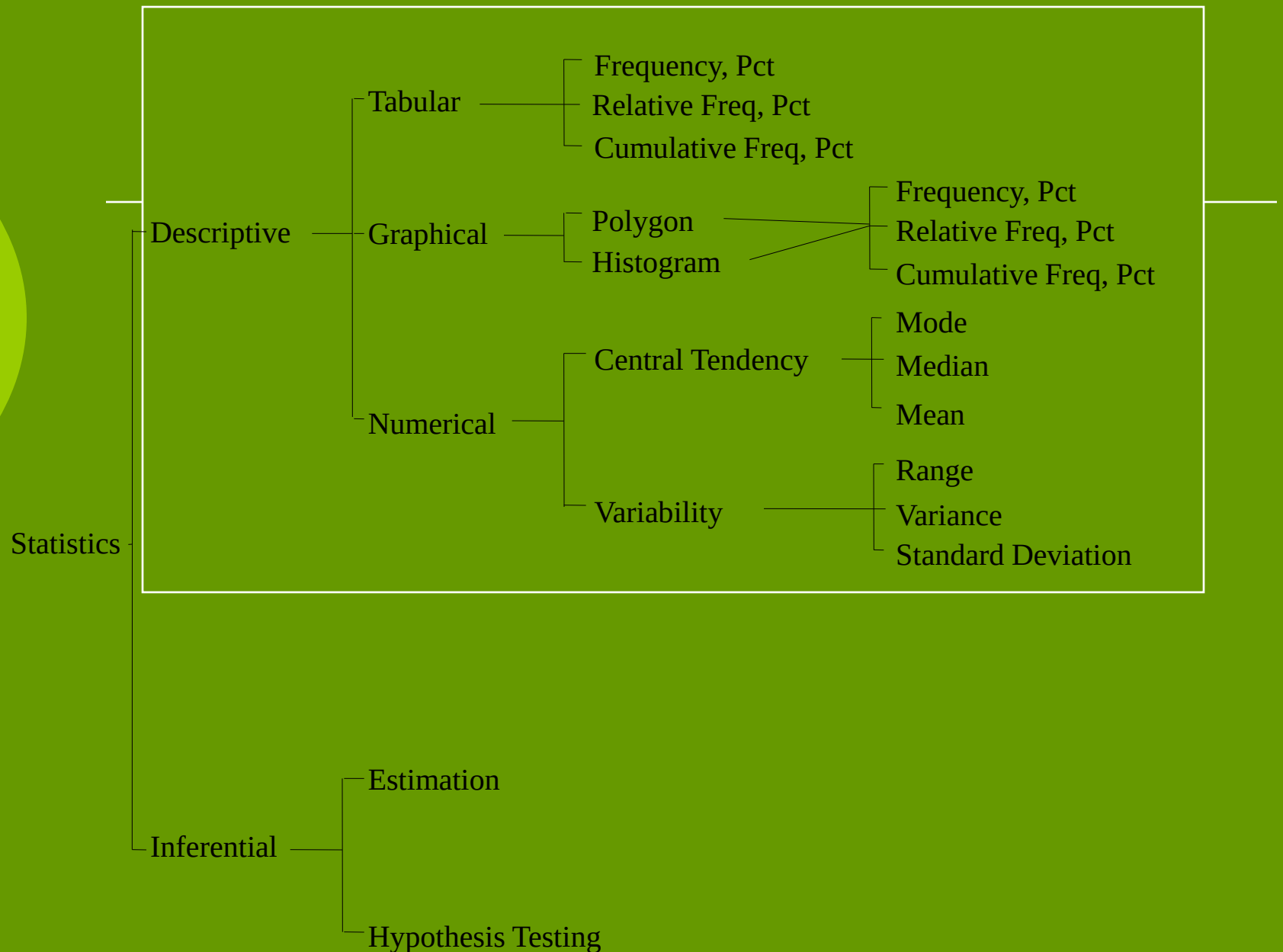
Null hypothesis is false

Reject the Null hypothesis

Possible Outcomes in Hypothesis Testing

	Null is True	Null is False
Accept	Correct Decision	Error Type II Error
Reject	Error Type I Error	Correct Decision

Type I Error: Rejecting a True Hypothesis
Type II Error: Accepting a False Hypothesis



Types of Statistical Tests

When running a t test

- We compare:
 - Mean differences between groups
- We assume
 - random sampling
 - the groups are homogeneous
 - distribution is normal
 - samples are large enough to represent population (>30)
 - DV Data: represented on an **interval or ratio** scale
- These are Parametric tests!

Inferential statistics

Used for Testing for Mean Differences

T-test: when experiments include only 2 groups

- a. Independent
- b. Correlated
 - i. Within-subjects
 - ii. Matched

Based on the t statistic (critical values)
based on
df & p level

Inferential statistics

Used for Testing for Mean Differences

Analysis of Variance (ANOVA): used
when

comparing more than 2 groups

1. Between Subjects
2. Within Subjects - repeated measures

Based on the f statistic (critical values)
based on

df & alpha level

More than one IV = factorial (iv=factors)

Only one IV=one-way anova

Types of Tests

When the assumptions are violated:

- Subjects were not randomly sampled
- DV Data:
 - Ordinal (ranked)
 - Nominal (categorized: brands of organic foods, types of rock, levels of education, learning styles)
 - The scores are greatly skewed or we have no knowledge of the distribution

We use tests that are equivalent to t test

Non-Parametric Test!

Chi Square

- used when data are nominal (both IV and DV)
 - Comparing frequencies of distributions occurring in different categories or groups
 - Tests whether group distributions are different
 - *Blue tit preference for the effectiveness of 3 brands of nuts*
 - determines the association between IV and DV by counting the frequencies of distribution
 - *Gender relative to study preference (alone or in group)*

Types of Chi Square

- A one-dimensional Chi Square
 - Determine if the observed frequencies are significantly different from the expected frequencies
 - 

X Y Z (3 brands of organic food)

40 30 20 (90 consumers)
 - Null hypothesis: there is no difference between consumers organic food preference
 - A two-dimensional Chi Square Frequencies are categorised along more than one dimensions



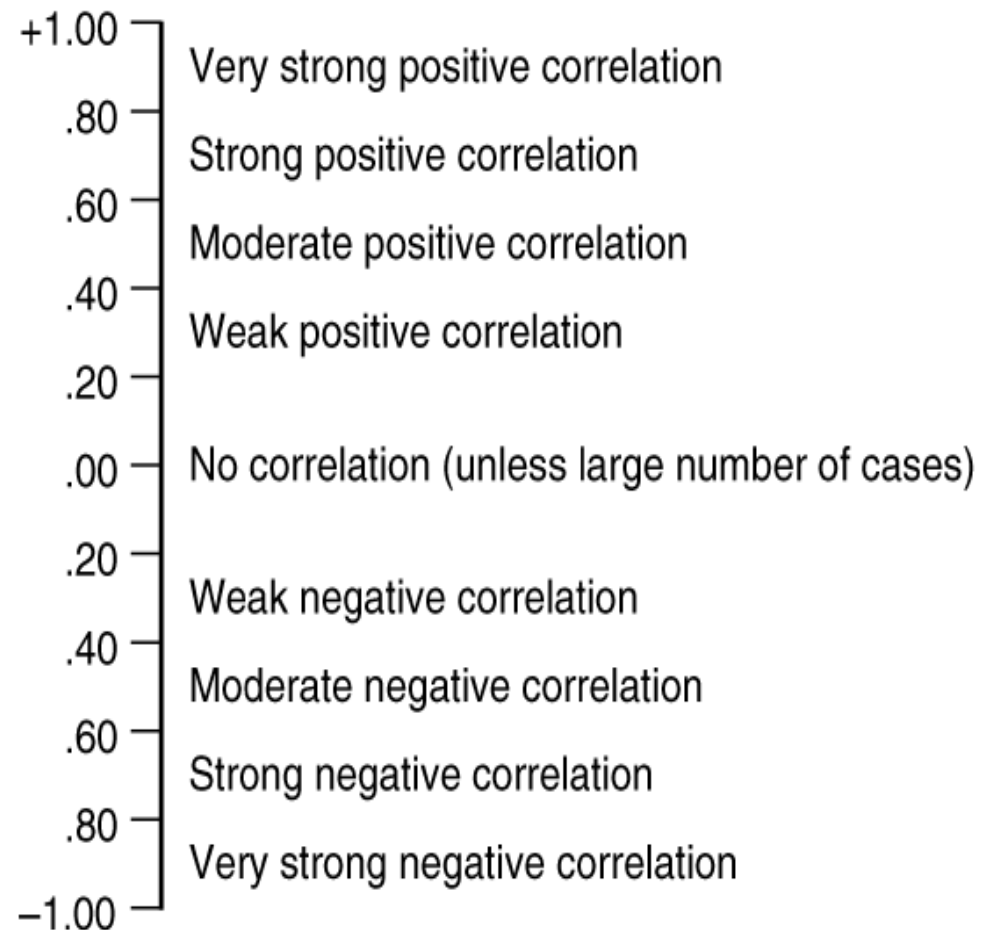
Correlation: Measure of **relationship** between two or more quantitative variables

Correlation Coefficient:

A number between -1 and $+1$ Which indicates the direction and strength of the relationship.

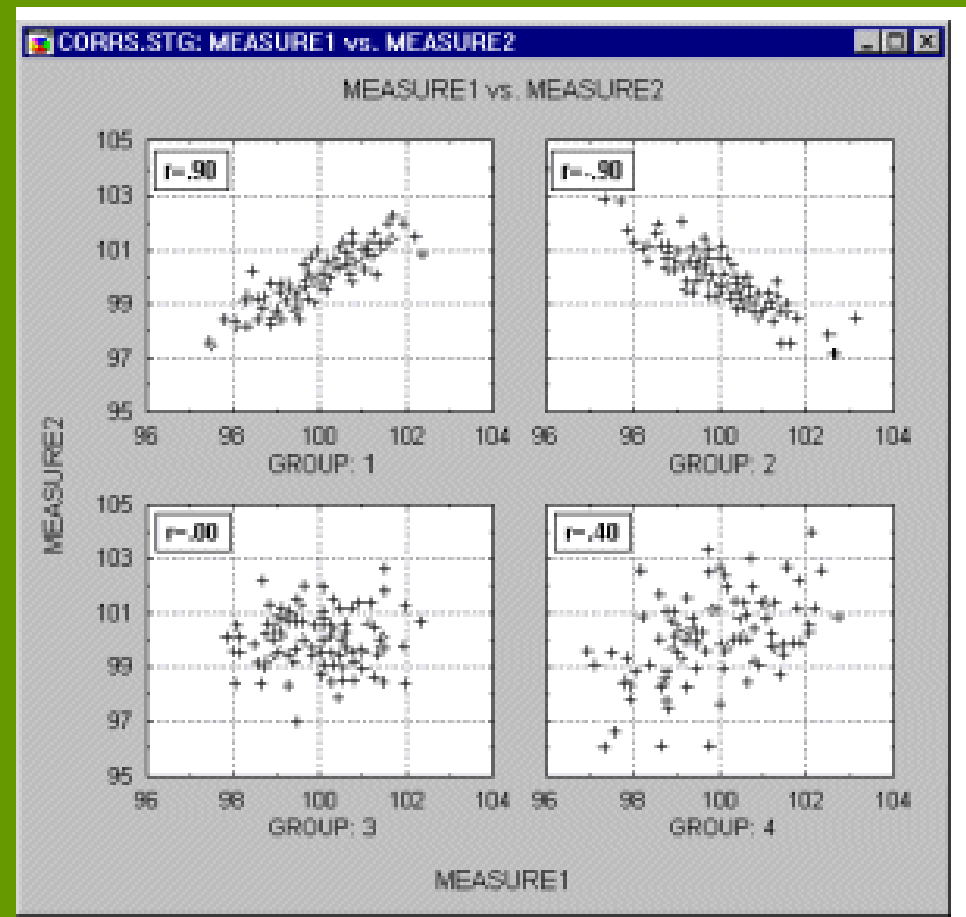
Pearson Product-Moment
Correlation

$$r = .45$$



Types of Correlation Tests

- Pearsons Correlation co-efficient
- Mann Whitney Test
- Spearman Rho or r



Statistical Significance

- Significance level in inferential statistical tests is measured by a “***p***” **value**, which is the probability that the findings are due to chance.
- Prior to the analysis, select a “**level of significance**”. If the “*p*” value falls at or below the prescribed level, then we say that our results are statistically significant.
- The selection of a significance level should be based on the study’s purpose, design and sample size. Commonly used significance levels in social science research are .05 and .001. A .05 *p* value means that we would expect to get the same results 95 times out of a hundred.

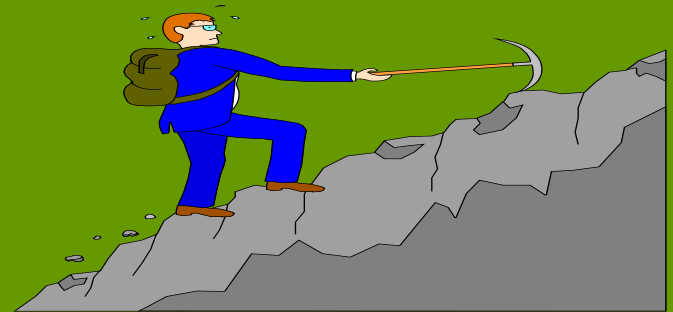
p-value interpretation

- The interpretation of a p-value is a little tricky
- In particular, it does **NOT** tell us the probability that the NULL hypothesis is true
- The p-value represents the chance that we would see a difference as big as we saw (or bigger) if there were really nothing happening other than chance variability

The Final Assault on the 'Summit'

Writing UP!

- Who am I writing for?
- What are the criteria they have set me?
- Length, format, style
- Time allocation
- Technical access
- When & Where Submission



The Opening Pages

- Title / Name & date / Declaration
- Abstract :
 - your research problem
 - why that problem is important and worth studying
 - your data and methods
 - main findings
- List of:
 - Contents
 - Figures
 - Tables

The Introduction



- Why this topic
- Your research approach
- Aims and objectives / hypotheses
- Link into the next chapter (All chapters should link conclusion of previous with intro. of next)

The Literature Review

- What do we already know about the topic?
- What do you have to say critically about what is already known?
- Similar studies
- How does your work fit into previous research?
- Why is your research relevant and worthwhile? (Silverman, 2000, p. 227)
- Be focused and critical (Do not only describe)
- Redraft after you have completed the other chapters

There must be method in this madness

- How you acquired the data?
- How is the data representative (sample)?
- The methods used
- Why these methods?
- Your form of analysis and why
- Why these methods and not others? Review



Data analysis

○ Introduction

- Set the scene and link to previous chapter
- What is the chapter addressing and link to objectives
- How does the chapter fill the gap?

○ Body

- Make one point at a time
- Analyse and indicate limitations
- Be convincing

○ Conclusion

- What the chapter did? Questions the chapter identified? Hypotheses / objective

Conclusion

- Relationship between your findings and the literature
- Relate to your hypotheses / objectives
- How would you change the study if you did it again?
- Any implications for policy and practice
- Future research directions and methods

Some Final Considerations

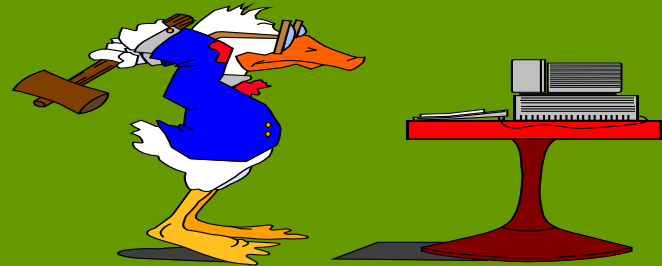
THE SONG
“**THE FINAL
COUNTDOWN**”
IS NOW
PLAYING IN
YOUR HEAD.

- Drafting and redrafting-Plan contents page first
- Grammar, punctuation, spelling
- Using table, figures etc...
- Time management
- Models
 - Read and consider ..\Seminars\model Inkpen.pdf

Yahoo I've Finished!

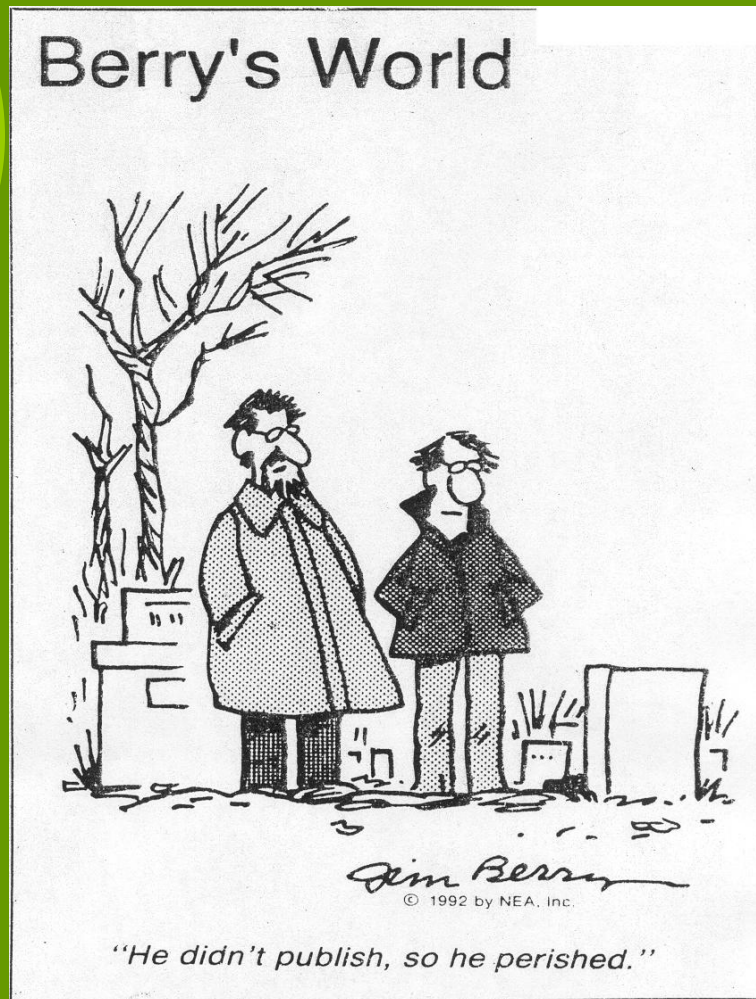
Publication, Further Research and Ethics

- Stress
- Time management
- Reflection
- Viva



- Self evaluation
- Lessons
- Learning

'Publish or Perish'



- Reviewers comments
- Focus
- Concise
- Re assess your audience
- "dedissertationalise" (Wolcott, 1990, p. 51)
- Choose an appropriate journal

Audience expectations

(Silverman, 2000, p. 272-277)

- Academic
 - Theoretical/factual developments
- Policy Makers
 - Practical/current
- Practitioners
 - Theory for better understanding
 - prac. suggestions / procedures
 - reform of existing practice
- Lay audiences
 - Better service / management



Future Research Proposals (Robson, 1994)

- **A quality proposal:**

- Direct and straightforward
- Clearly communicated
- Well organised
- Good topic area
- Realistic

- **Should contain:**

- Summary/abstract
- Background and purpose
- Plan
- Ethical issues

Ethics:

An increasingly important consideration (Robson, 1994)

- Consent
- Deception
- Debriefing
- Withdrawal of information/participation
- Confidentiality (*Data Protection Act*)
- Observational research
- Peers
- Other



Conclusion

- Module Aim
- Dissertation
- What you have learnt
- What you have understood
- Reading for a degree
- GOOD LUCK!

