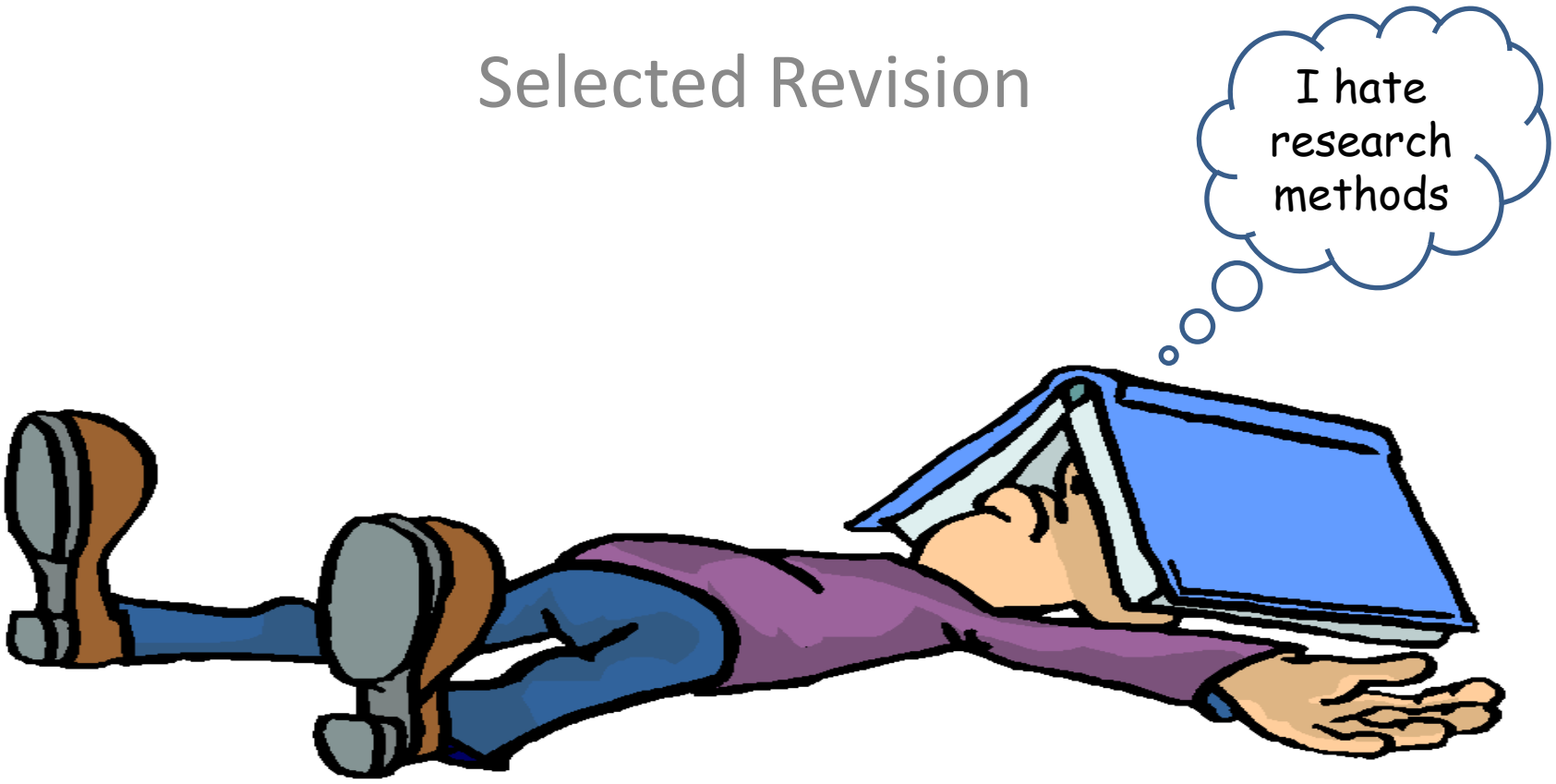
Advanced Research Methods

Selected Revision



Syllabus

This section builds on the knowledge and skills developed at AS level.

Candidates will be expected to:

- understand the application of scientific method in psychology
- design investigations
- understand how to analyse and interpret data arising from such investigations,
- report on practical investigations.

In order to gain sufficient understanding of the design and conduct of scientific research in psychology, candidates will need to practise these skills by carrying out, analysing and reporting small-scale investigation.

The application of scientific method in psychology	• The major features of science, including replicability, objectivity, theory construction, hypothesis testing, the use of empirical methods • Validating new knowledge and the role of peer review
Designing psychological investigations	• Selection and application of appropriate research methods • Implications of sampling strategies, for example, bias and generalising • Issues of reliability, including types of reliability, assessment of reliability, improving reliability • Assessing and improving validity, including internal and external • Ethical considerations in design and conduct of psychological research
Data analysis and reporting on investigations	• Appropriate selection of graphical representations • Probability and significance, including the interpretation of significance and Type 1/Type 2 errors • Factors affecting choice of statistical test, including levels of measurement • The use of inferential analysis, including Spearman's Rho, Mann-Whitney, Wilcoxon, Chi-Squared • Analysis and interpretation of qualitative data • Conventions of reporting on psychological investigations

Features of a Science

- THEORIES allow for the generation of **TESTABLE and FALSIFIABLE Hypotheses** (i.e. theories and concepts are not abstract and are clearly operationalised)
- Testing (evidence) is based on **CONTROLLED, EMPIRICAL METHODS (e.g. Lab Experiments NOT anecdotal accounts)**
- Research and findings are **REPLICABLE ('reliability') (due to STANDARDISATION, clear instructions and detailed operationalisation) .** This is key because it allows researchers to check findings and ensure that they are accurate and robust. Non replicable research and findings may indicate flaws with a study or bias
- **OBJECTIVITY** is essential – no room for **BIAS and SUBJECTIVITY**
- Theories are **PARSIMONIOUS** and Paradigms (a generally accepted viewpoint) can be established; theories are refined in light of contradictory evidence; **hypothetico-deductive model** is followed

Be prepared to be given a stimulus and say what features of a science it has / doesn't have!

Reports and Publication

SECTIONS OF A REPORT

(make sure you say what goes in each)

- Title
- Abstract
- Introduction (including background research to ground the current study and establish where the hypotheses have developed from)
- Hypotheses (experimental and null)
- Method and Procedure (lots in here)
- Results (analysed data not raw data)
- Conclusions
- Discussion
- References ('HARVARD' style)
- Appendices

Validating new knowledge

- Published report is sent for **PEER REVIEW,** which involves research being **submitted to a panel of experts** for **scrutiny**. They will check the quality of the report (e.g. analysis, conclusions) and suggest changes that need to be made before publication

- **Strengths** of this process
  - *Ensures only GOOD QUALITY research is published and communicated to the public*
- **Weaknesses** of this process?
  - *Still the opportunity for BIAS amongst reviewers (e.g. favour for research from top institutions…). This is why there are often MULTIPLE reviewers.*

Designing Psychological Investigations

You must be able to **select** and **justify** the use of an appropriate **RESEARCH METHOD**

- *'**Justification**' = what are the **advantages** of your chosen method over alternative methods?*
- *Be prepared to say **HOW** they are used (describe) and to **EVALUATE***

OBSERVATIONS

- *you need include reference to **BEHAVIOUR CATEGORIES** and could include reference to TIME or EVENT sampling and specific types of observation*

EXPERIMENTS

- *Lab vs FIELD vs NATURAL – what is the difference?*

SELF REPORT METHODS

- *Questionnaires vs Interviews – how are they different? Which is better? Closed and open questions*

CASE STUDIES

CORRELATIONAL STUDIES

PILOT STUDIES

- *Are… Used because…*

PILOT STUDIES

- Small scale trial runs of research conducted before the main study
- Used why?
  - **To ensure the participants understand instructions**
  - **To identify any unforeseen ethical and methodological issues**

SELF REPORT METHODS

INTERVIEWS

- **Open questions** predominantly
- Normally **semi structured** – researcher develops questions based on previous answers
- Researcher can assess **verbal and non verbal** communication

STRENGTHS – often provides more in depth detail than questionnaires as themes can be explored as they occur

WEAKNESSES – may still be an affect from demand characteristics. PPTS may feel under pressure due to face to face nature so answers may not be genuine

More time consuming than questionnaires

Interviewer may influence questioning (investigator effects)

QUESTIONNAIRES

- **Written** – researcher often NOT present
- **Open and Closed** questions
- Distributed to a large group at once

STRENGTHS – Economical and efficient way to collect large amounts of data, especially about sensitive aspects which cannot be ethically investigated using experiments

Less pressure as PPTS can complete them anonymously but…

WEAKNESSES – …Social desirability and demand characteristics may influence responses so answers may not be an accurate representation of what is being investigated. Respondents may only give answers they think are socially acceptable, even if this does not match their real thoughts, experiences, etc. Also, respondents may not give accurate answers as they may not understand the question and there is no one there to explain it to them

Arguably less detailed than interviews because…

Make sure you can explain WHY an interview would be used instead of a questionnaire and vica versa

OBSERVATIONS

- Researcher observes a natural situation (naturalistic observation) or creates a situation during which he will observe behaviour (controlled observation).
- Generally **BEHAVIOURAL CATEGORIES are used**
  - *These are clearly defined examples of behaviours which a researcher EXPECTS to see during the observation. When one is observed, the researcher 'ticks' the category. The ticks in the categories are later compared and analysed*
- **TIME** sampling (when a researcher only conducts an observation for a set time only and only records all behaviours during this time) or **EVENT** sampling (when a researcher records all behaviours which occur during the entire observation) can be used.
- Observations can be **DISCLOSED** (**OVERT**) when the PPTS know they are being observed or **UNDISCLOSED** (**COVERT**) when the PPTS do not know they are being observed

STRENGTHS and WEAKNESSES depend on the SPECIFIC TYPE OF OBSERVATION being used. However some general points include…

- Issues with BIAS and SUBJECTIVITY – different researchers may apply the behavioural categories differently. This leads to low inter-rater reliability. This can be overcome if different observers are trained well, if the instructions are clear and standardised and if the behavioural categories are CLEARLY OPERATIONALISED
- If participants do not know they are being observed then there are ethical issues with DECEPTION and a LACK OF INFORMED CONSENT and A RIGHT TO WITHDRAW
- However, if the PPTS do know they are being observed they may alter their behaviour and behave unnaturally (influence of demand characteristics) so the observational data may LACK VALIDITY

CASE STUDY

- An in depth study of an individual or small group.
- Normally conducted over a long period of time ('longitudinal')
- Multiple methods (e.g. interviews, questionnaires, behavioural observations, experimentation) are used to gather data about the individual or small group

STRENGTHS

- Due to the fact multiple methods are used to gather data, case studies generally give us a lot of detailed information about the person/persons being studied
- Again, case studies are often an ethical way to investigate sensitive aspects which cannot be ethically investigated using experiments (e.g. effects of abuse)

WEAKNESSES

- Low population validity. Case studies are conducted on a small group or individual so we cannot be sure other people would respond in the same way to the experiences. This means the results and conclusions are not representative and may not generalise beyond the case study to other people
- Issues with bias – There is a risk that the researcher may develop a close emotional relationship with the subject of the case study due to the fact they will be working closely together for a long period of time. This may BIAS their assessments

Correlational Method

- Allow researchers to investigate the RELATIONSHIP between TWO variables
- Positive relationship = one variable goes up, the other variable goes up as well
- Negative relationship = one variable goes up but the other variable goes down
- The strength of this relationship is indicated in a **correlation coefficient** (-1 -> +1, where +1 indicates a perfect positive correlation, 0 represents no correlation and -1 indicates a perfect negative correaltion)
- Results can be represented in a **scatter graph.**

STRENGTHS

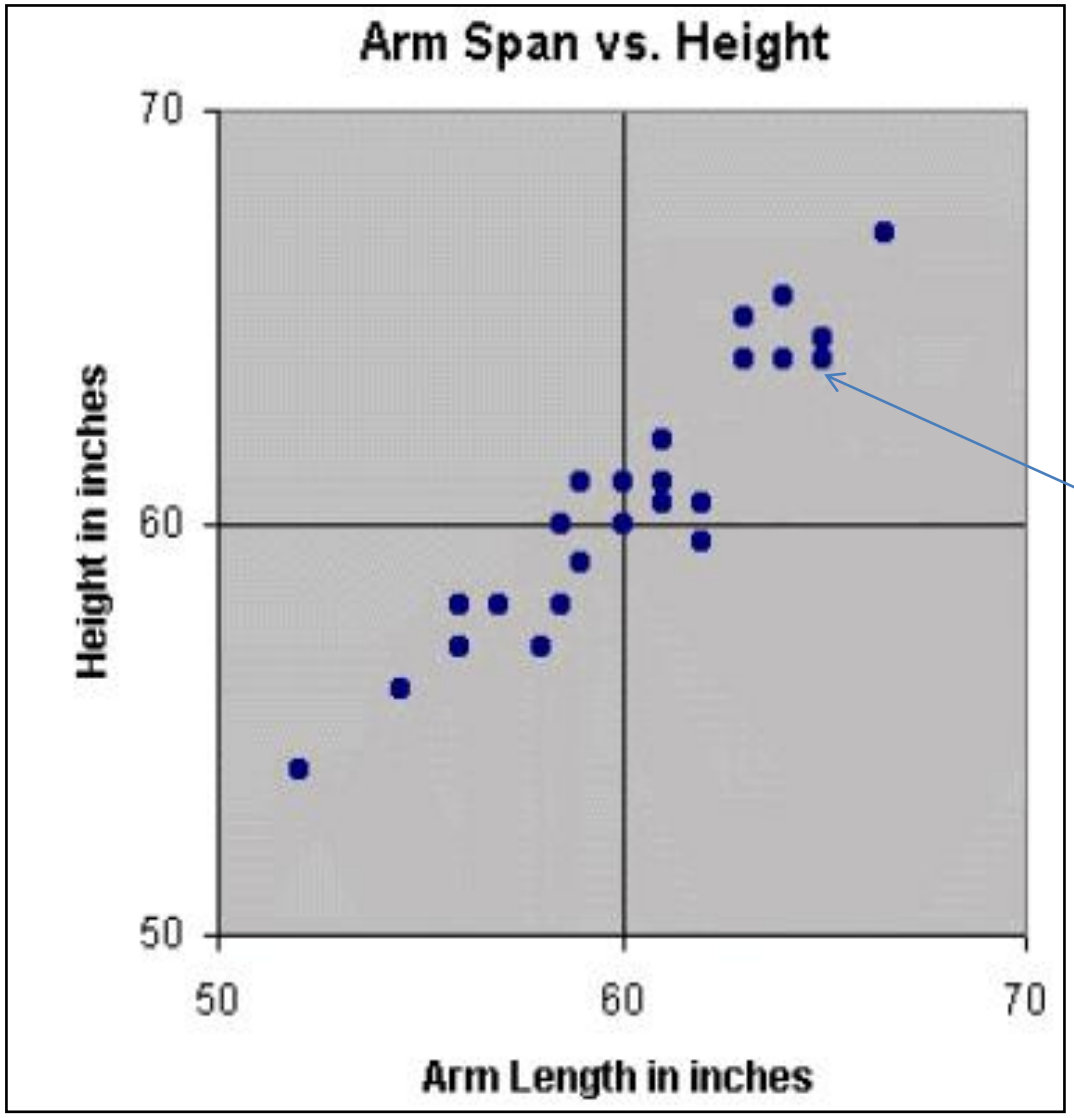
- An ethical way to investigate aspects which cannot be directly tested / manipulated via experiments as we are only MEASURING aspects.
- Allow us to see relationships between aspects which can stimulate future research

WEAKNESSES

- Do not show cause and effect, only a relationship. We cannot be sure that one variable is directly causing the changes in the other; other aspects may be having more of an effect.
- Correlations only show LINEAR relationships and often relationships between variables in psychology are much more complex

Make sure you ADAPT your hypotheses if asked to write one for a correlation study!!! Students always get this wrong!

Correlations (scattergraphs)



Correlations allow us to investigate RELATIONSHIPS between variables.

- A STRENGTH is that they are an ethical way to investigate aspects which cannot be experimentally tested
- A WEAKNESS is that they do not allow us to establish cause and effect – *what does this mean?*

What is each dot / point? A single piece of data (one participant)

You can interpret the direction and strength of relationships

You could guess the correlation coefficient

You can comment on OUTLIERS

Experimental Methods

LAB EXPERIMENTS
- Conducted in a controlled, artificial environment (E.Vs controlled)
- Researcher manipulates I.V and measures DV (normally quantitative)

STRENGTHS
- High internal Validity - Cause and effect can be implied as EVs are controlled; Can be more sure the DV change is a response to IV manipulation

WEAKNESSES
- Artificial environment may lead to artificial behaviour (low ecological validity)

FIELD EXPERIMENTS
- Conducted in a natural environment for the PPTS
- Researcher manipulates IV and Measures DV

STRENGTHS
- Higher ecological validity – PPTS in a natural environment so are more likely to demonstrate natural real life behaviour

WEAKNESSES
- Lower internal validity - More difficult to imply cause and effect as EVs cannot be controlled. We cannot be sure any DV change is definitely the result of the IV manipulation

NATURAL EXPERIMENTS
- Conducted in a natural environment for the PPTS
- IV is manipulated by a naturally occurring phenomenon; researcher simply measures DV

STRENGTHS
- Highest ecological validity – PPTS in a natural environment so are more likely to demonstrate natural real life behaviour

WEAKNESSES
- Low internal validity - More difficult to imply cause and effect as EVs cannot be controlled. We cannot be sure any DV change is definitely the result of the IV manipulation

EXPERIMENTAL DESIGN

- do not get this confused with research methods!!!

- This refers to how participants **IN AN EXPERIMENT** are **ALLOCATED** to each condition (i.e. 'who' is in each condition)
- Make sure you can explain how each design is used, the S&W of each, and how the problems can be overcome

Mr B. Tip – if you are asked why you / a researcher has chosen a particular design, COMPARE it to another!

Also, if you are asked how you can overcome a problem with a specific experimental design, you can always say you can use a different one (but say why this is an advantage)

Experimental Designs

REPEATED MEASURES	• PPTS do all conditions (same PPTS in each condition)	**STRENGTHS** • PPT variables / individual differences eliminated • Fewer PPTS needed	**WEAKNESSES** • Order effects (e.g. boredom, fatigue, demand characteristics such as guessing the aim) may be an issue - can be overcome by COUNTERBALANCING
INDEPENDENT MEASURES	• PPTS are randomly allocated to ONE of the conditions only (different PPTS in each condition	**STRENGTHS** • No order effects • Same materials can be used in each condition	**WEAKNESSES** • Participant variables (individual differences) are a problem. Any differences across conditions may be a result of the different people rather than the IV manipulation • More PPTS required
MATCHED PAIRS	• Pairs of participants are matched on key variables then each is randomly allocated to one condition or the other	**STRENGTHS** • No order effects • Controls participant variables to an extent • Same materials can be used in each condition	**WEAKNESSES** • Very difficult to match PPTS across all variable which may impact on the study so individual differences are still a problem. • More PPTS required

SAMPLING METHODS

- How we GENERATE our PPT sample

RANDOM SAMPLING

* Gather info on **EVERYONE** in the population
* Use an **unbiased method** (e.g. drawing names out of a hat) to select a sample

A **strength** is high population validity as it offers the greatest chance of a representative sample as everyone in the target population has a chance of being selected

A **weakness** is that it is limited as it cannot be used with a large population as info needs to be gathered on everyone first.

VOLUNTEER SAMPLING

- An advert explaining the nature of the study is placed in a place appropriate for the target population
- A sample is drawn from the people who respond

A **strength** is that it is a quick and easy way to gather participants as they are self selecting

A **weakness** is low population validity as the sample is likely to be unrepresentative (biased) as only a certain type of person will volunteer.

OPPORTUNITY SAMPLE

- A sample is gathered from the people who happen to be available at the time of a study.
- *E.G A lecturer using 50 of his own students*

A **strength** is that it is a quick and easy way to gather participants as researchers simply use who is available at any one time

A **weakness** is low population validity as the sample is likely to be unrepresentative (biased) as only a certain type of person is likely to be available.

SAMPLING

- A researcher needs to recruit students for a study into memory.
  - ***Explain how the researcher could use random sampling to select his participants***

- A researcher wants to test the effectiveness of a new revision strategy for A level students. For this study she uses a volunteer sample
  - ***Explain how the researcher could obtain her sample***

- Dave, a middle-aged male researcher, approached an adult in a busy street. He asked the adult for directions to the train station. He repeated this with 29 other adults.
- Each of the 30 adults was then approached by a second researcher, called Sam, who showed each of them 10 photographs of different middle-aged men, including a photograph of Dave. Sam asked the 30 adults to choose the photograph of the person who had asked them for directions to the train station.
- Sam estimated the age of each of the 30 adults and recorded whether each one had correctly chosen the photograph of Dave.
  - ***Identify the sampling method used in the above study***
  - ***Explain a limitation with the sampling method used***

Designing Investigations

- Make sure you can write a **FULLY OPERATIONALISED hypothesis**
  - ***Directional / One tailed***
    - state what will happen – 'more', 'less', 'faster' , 'slower'
  - ***Non Directional / Two Tailed***
    - There will be a difference / relationship but don't say what this will be
  - ***NB. A <u>Non-Directional hypothesis is used when there is little or no previous research</u> in the area so we are not sure what results we will get. A directional hypothesis is used if there is previous research indicating that a particular outcome is likely***
  - ***Null***
    - There will be no difference / relationship
- **<u>NB. Note the difference when writing a hypothesis for a CORRELATIONAL STUDY – THIS IS KEY</u>**

Always fully operationalise variables and refer to both conditions

- Make sure you can **fully operationalise** I.V (give ALL conditions), D.V (say EXACTLY how it is being measured)
- Say how **EXTRANEOUS VARIABLES** (investigator effects, demand characteristics, situational variables, participant variables) can be controlled

E.G.

<u>EXPERIMENTAL</u> – *Directional (one tailed) or non directional (two tailed)?*

- Students who are taught a memory improvement strategy will remember more words from a list – **NOT GOOD ENOUGH! WHY?**

- Students who are taught a **memory improvement strategy such as the method of loci** will remember more words **from a list of 20 compared to** students who are not taught a memory improvement strategy

<u>NULL</u>?

- Students who are taught a memory improvement strategy will not remember more words from a list compared to students who are not taught a memory improvement strategy **– NO!!!**

- There will be **NO DIFFERENCE** between the number of words from a list of 20 remembered by students taught a memory improvement strategy **compared to** those who are not taught a memory improvement strategy

A researcher investigated the effect of age of starting day care on levels of aggression. Four-year-old children attending a day nursery were used. Each child was assessed by the researcher and given an aggression score. A high score indicated a high level of aggression. A low score indicated a low level of aggression. The maximum score was 50.

Table 1 **Mean aggression scores for four-year-old children who had started day care before the age of two or after the age of two**

	Started day care before the age of two	Started day care after the age of two
Mean score	25	23

1. Operationalise the independent variable (2) and the dependent variable (2)

2. State an appropriate directional hypothesis (2)

3. Other than the independent variable, what else may have influenced the children's levels of aggression?

HYPOTHESES
- Adapting for a correlational study

DIRECTIONAL

- *There will be a (strong) **POSITIVE RELATIONSHIP** between the time a child spends in day care and their level of aggression, as assessed by a rating given by teachers on a scale of 0-50 (50 being high aggression)*

NON DIRECTIONAL

- *There will be **A RELATIONSHIP** between the time a child spends in day care and their level of aggression, as assessed by a rating given by teachers on a scale of 0-50 (50 being high aggression)*

NULL

- *There will be **NO RELATIONSHIP** between the time a child spends in day care and their level of aggression, as assessed by a rating given by teachers on a scale of 0-50 (50 being high aggression)*

We still FULLY OPERATIONALISE our variables and we still mention BOTH variables. We could mention the likely strength of the relationship too

Reliability

- *Consistency*

Type	This means	Measured by	Threats	Improved by
Internal RELIABILITY	Consistency within a test	Split-half method	Poorly designed materials	Ensuring tests are standardised throughout
External RELIABILITY	Ability to produce same results every time (e.g. during replications or across different researchers [inter-rater reliability])	Test-Retest	Researcher bias, lack of standardisation	Use a pilot study to ensure the measurements work properly, Standardise the procedure Use multiple researchers to avoid bias but make sure they are all using standardised materials / instructions

VALIDITY = *accuracy – is the test measuring what it is claiming to measure?)*

Type	This means	Measured by	Threats	Improved by
Internal VALIDITY	Does the study measure what it claims to?	Ask an expert in the field to assess **FACE VALIDITY** Assess **CONCURRENT VALIDITY** by comparing the new method to a previous, established method and seeing if they generate the same results	Uncontrolled extraneous variables, demand characteristics, experimenter bias Poorly operationalised variables	Use a lab exp to control extraneous variables Single blind technique to control demand characteristics Double blind technique to control experimenter bias
External VALIDITY	How well the results of the study can be generalised **beyond the study** *POPULATION validity – can the results be generalised to other people in the target population* *ECOLOGICAL VALIDITY – does the study reflect real life?* *MUNDANE REALISM – are the tasks realistic*	Assessing **FACE VALIDITY** (see above) Assessing **PREDICTIVE VALIDITY** (seeing if conclusions accurately predict later performance)	Use of unnatural, artificial tasks and environments Use of **SAMPLING** methods which generate biased samples (e.g. Volunteer)	Use real life settings and tasks during the study (e.g. Field experiments as opposed to lab) Use a representative sampling method such RANDOM SAMPLING

ETHICS

- **BPS Ethical Guidelines** – can you name them all? You should be able to!
  - *Make sure you can explain HOW they can be applied to a study*
  - *You may be asked to discuss if a study has 'shown an awareness of ethical guidelines'*

- **'ISSUES' occur when the guidelines are potentially being broken**

- How can we **overcome ethical issues**
  - *A full **DEBRIEF**, which involves a full explanation of the aims of the study (overcomes deception), offers the PPT the chance to agree for their data to be used (retrospective consent) or to withdraw their data (right to withdraw), offers follow up help and support if needed (overcomes issues with protection)*
  - *Other ways to gain consent (parents/careers if the participants are young or cannot understand the nature of the study; prior general consent; presumptive consent)*

- If you are struggling, **CONFIDENTIALITY** is an easy one to explain / apply…

  "Researchers would need to ensure confidentiality throughout. To do this they would not use any personal information about the participants during the study or in their report. They could use pseudonyms or refer to PPTs by a number and would not include information such as addresses as this may mean that PPTs could be identified."

Data Analysis

Graphs and Charts – make sure you can interpret and produce these

- *Scatter graphs for correlations. Each mark = 1 bit of data / 1 participant.*
  - Explain EXPLICITLY the strength and direction of the relationship (e.g. apply to the specific variables)
  - Apply a correlation coefficient (best guess)
- *Bar Charts for nominal data*
- *Histograms for ordinal / continuous data*

Summary Tables – make sure you can draw conclusions. **NOTE THE MARKS AVAILABLE (2 marks = 2 points)**

Measures of Central Tendency – show AVERAGE

- *MEAN, MODE, MEDIAN (NB. The mean is the inly one which takes into account the VALUE of all the data but it is the one which is MOST affected by OUTLIERS)*

Measures of Dispersion show how much VARIATION there is in the data

- *Range, Standard Deviation (variation away from the mean)*

Make sure you know the strengths and weaknesses of the measures of CT and measures of dispersion

2 x 2 Contingency Table

- *Nominal Data*

Could be asked to PRODUCE or INTERPRET

	First Born	Second Born
Artists	20	30
Lawyers	35	30

Could include TOTALS

	First Born	Second Born	***TOTAL***
Artists	20	30	**50**
Lawyers	35	30	**65**
TOTAL	**55**	**60**	**115**

Ranking

- Ordinal data / Interval Ratio Data

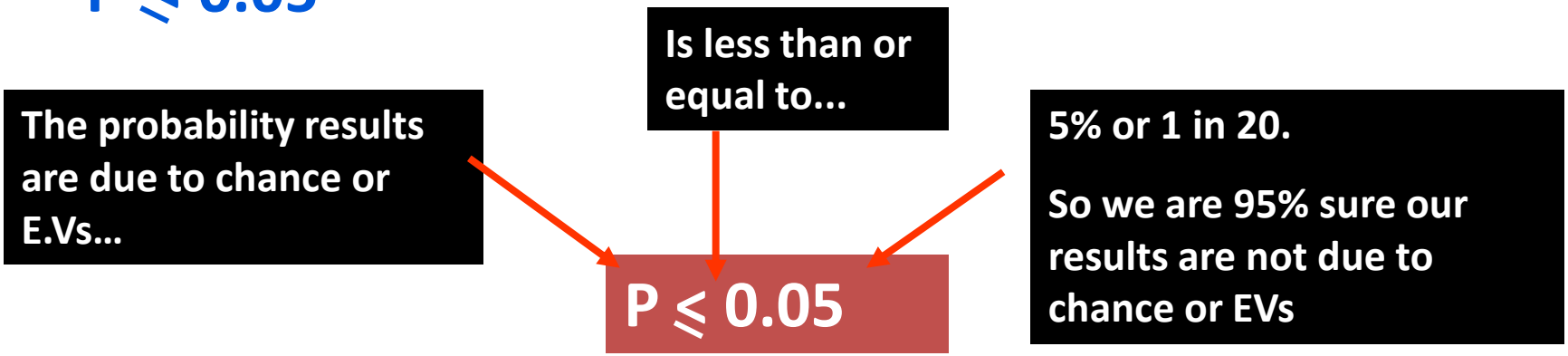
- You may be asked to rank data.
- Lowest score = rank of 1!
- Watch out for TIED RANKS. Here you would assign the average of the ranks

Participant Number	Test Score	Rank
1	8	**4.5**
2	7	**3**
3	5	**2**
4	8	**4.5**
5	10	**6**
6	2	**1**

Note what has happened here!

Probability and Levels of Significance

- Make sure you know how to explain levels of significance
- **$P \leqslant 0.05$**



- Always use this level of detail; likely to be for 3 marks

Type 1 and Type 2 Errors

- If we accept our experimental hyp and reject our null but results are actually due to chance we have made a **TYPE ONE** error (we should've accepted our null)
  - ***This may happen if our level of significance is TOO LENIENT (too high) e.g. p<0.1***

- If we reject our experimental hyp and accept our null but there is actually a significant difference or relationship we have made a **TYPE 2 ERROR** (we should've rejected our null)
  - ***This may happen if our level of significance is TOO STRINGENT (too low) e.g. P<0.001***

Type 1 and Type 2 Errors

How do we know if we have made a type 1 or type 2 error?

- **DO THE STUDY AGAIN**. If the results are still significant (or not significant in the case of type 2), we can be **MORE CONFIDENT** we haven't made an error.
- Look at if the significance changes at **DIFFERENT LEVELS OF SIGNIFICANCE** (P values)
  - *If you think you may have made a type 1 error, look to see if the result (calculated value) is significant at a more stringent level of significance. If it is still significant, you can be more confident that you haven't made a type 1 error as there is LESS CHANCE the results are due to chance/extraneous variables*

Extract from a table of critical values of Spearman's rho (r_s)

Level of significance for a one-tailed test		
	0.05	0.01
Level of significance for a two-tailed test		
	0.10	0.02
N=29	0.312	0.433
30	0.306	0.425
31	0.301	0.418

Calculated r_s must equal or exceed the table (critical) value for significance at the level shown.

(h) Explain what is meant by a Type 1 error.

(2)

(i) Use the information in the table above to explain why the psychologists did not think that they had made a Type 1 error in this case.

(3)

(Total 19 marks)

Levels of Measurement

NOMINAL

- *This is data which is in discrete categories. E.g. counting the number of men and women in a situation.*

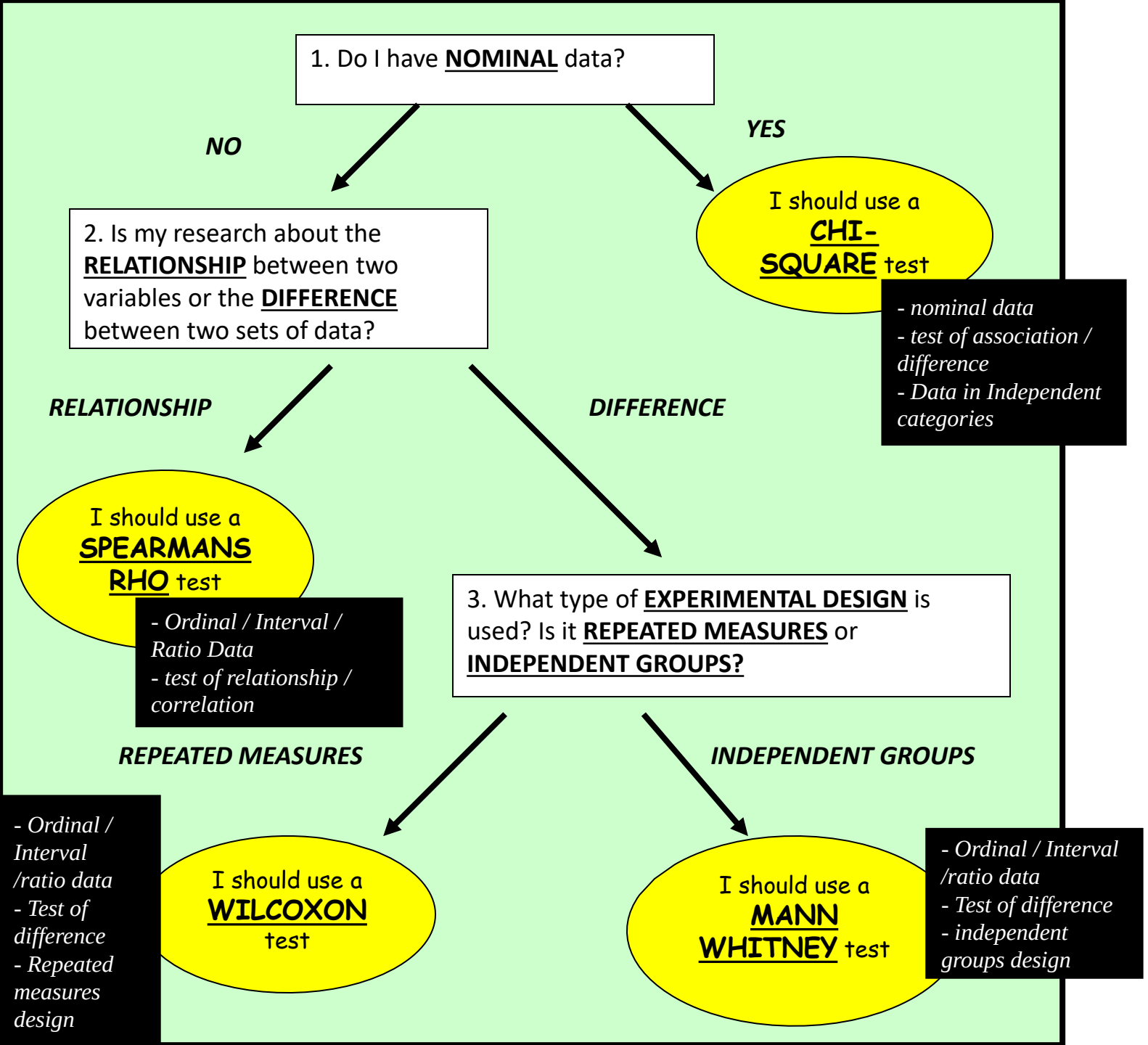
ORDINAL

- *This is data which is ordered, ranked or on a scale but where we do not know the difference between the positions / points. E.g. ranking students in a class*

INTERVAL / RATIO

- *This is when data has equal intervals (i.e. we know how different two data points are). E.g time taken to complete a memory test.*

Which inferential test?



Interpreting Significance

- You will be given the **CALCULATED VALUE** but you have to find out if this is significant by comparing it to the **CRITICAL (Table) value**
- To find the correct critical value...
  - ***Do you have a One tailed (directional) or two tailed (non directional) hyp***
  - ***Level of significance ('P' value)***
  - ***Then...***
    - **DF** (Chi Square) = from the 'contingency' table

      (number of columns – 1) x (number of columns – 1)
    - **N** (Spearmans) = number of PPTS
    - **N** (Wilcoxon) = number of pairs of scores
    - $\mathbf{N^1}$ (number of PPTS in smaller sample) and $\mathbf{N^2}$ (number of PPTS in larger sample) (Mann Whitney)

- Does the critical have to be greater than or less than the table value? Spot the R... (but this is likely to be given to you)

- Remember to engage with the stimulus and data when explaining if the results are significant if for more than 1 mark

A note on style...

- After using the stat table to interpret significance, always give your answer in the same way (and use numbers)

"Our calculated value of ___ is greater than/less than the critical value of ___ for P<0.05 (or whatever you are told to use). This means the results are/are not significant. We will therefore accept/reject our experimental hypothesis and accept/reject our null hypothesis."

1. The psychologists used a non directional hypothesis. Why may they have used a non directional hypothesis? (2)

She analysed her data using a statistical test and calculated a value of $x^2 = 2.27$. She then looked at the relevant table to see whether this value was statistically significant. An extract from the table is provided below.

Table: Critical values of x^2

Level of significance for a one-tailed test				
	0.10	0.05	0.025	0.01
Level of significance for a two-tailed test				
	0.20	0.10	0.05	0.02
df				
1	1.64	2.71	3.84	5.41

Calculated value of x^2 must be equal to or exceed the table (critical) values for significance at the level shown

(3)

2. Explain if the psychologists have found a significant result (3)

Some studies have suggested that there may be a relationship between intelligence and happiness. To investigate this claim, a psychologist used a standardised test to measure intelligence in a sample of 30 children aged 11 years, who were chosen from a local secondary school. He also asked the children to complete a self-report questionnaire designed to measure happiness. The score from the intelligence test was correlated with the score from the happiness questionnaire. The psychologist used a Spearman's rho test to analyse the data. He found that the correlation between intelligence and happiness at age 11 was +0.42.

Extract from table of critical values from Spearman's rho(r_s) test

N (number of participants)	**Level of significance for a two-tailed test**	
	0.10	**0.05**
	Level of significance for a one-tailed test	
	0.05	**0.025**
29	0.312	0.368
30	0.306	0.362
31	0.301	0.356

Calculated r_s must equal or exceed the table (critical) value for significance at the level shown.

(f) The psychologist used a non-directional hypothesis. Using the table above, state whether or not the correlation between intelligence and happiness at age 11 (+0.42) was significant. Explain your answer.

(3)

Analysis of Qualitative Data

- Qualitative Data is often much more rich and realistic compared to quantitative (numerical) data. However, it is difficult to analyse

- **Thematic Analysis**
  - *Go through the data and identify common themes. Use these to establish conclusions*
- **CONTENT ANALYSIS**
  - *Gather data*
  - *Develop coding category relating to things you expect to see*
  - *Go through the data and tally every time some occurs which fits a coding category*
  - *Analyse the tallies using statistical methods*
  - *The ADVANTAGE of this is that it converts qualitative data into quantitative data.*

- A general DISADVANTAGE of qualitative data analysis is that it is often SUBJECTIVE and therefore heavily influenced by BIAS

Design a study into… (10 marks ish)

- You need to talk about more than the procedure.
- **YOU MIGHT BE TOLD WHAT TO write about – DO THIS!**
- If not, you have lots potentially include
  - *Aims*
  - *Hypotheses (directional / non directional (justified); experimental and null – FULLY OPERATIONALISED)*
  - *IV, DV, V1, V2 FULLY OPERATIONLISED*
  - *Research method (justified [why you are using it] with detail about how they will be employed; experimental design if applicable [justified and explained])*
  - *Apparatus and materials*
  - *Sample and sampling method (including how the sampling method will be used and why you are using this method)*
  - *Procedure (be specific, e.g. where are observers/researchers positioned; how materials are being used, etc. EXPLAIN FROM INSTRUCTIONS TO DEBRIEF)*
  - *Data collection techniques and level of measurement*
  - *Method of analysis*
  - *Steps to ensure scientific rigour (e.g. standardisation, control over E.Vs)*
  - *Ethical considerations (how guidelines will be met, potential ethical issues and how to overcome these)*