Lesson 13

Kinds of Data (Including Meta-Analysis)

Lesson Objectives

- All students **will** define key terms and identify types of data in new scenarios.
- All students **should** explain why certain types of data have been used in new scenarios and the use of 'effect size' in research.
- All students **could** evaluate meta-analyses and types of data.

Key Words

- Quantitative data
- Qualitative data
- Primary data
- Secondary data
- Meta-analysis
- Effect size

Extension activity:

- Go to https://www.hoddereducation.co.uk/magazines/magazines-extras/psychology-review-extras and scroll down to *Volume 21, No. 2, November 2015*. Here, you will find a short podcast in which Matt Jarvis discusses how and why psychologists use meta-analysis.

Questions to guide your thinking ...

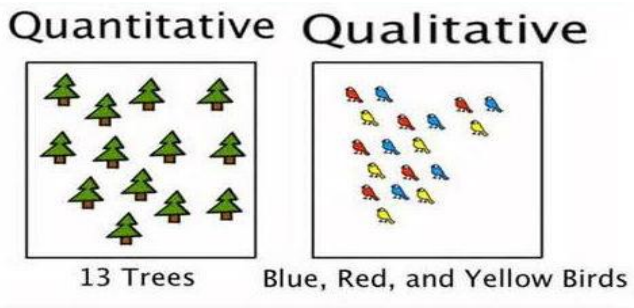
- What is the difference between quantitative and qualitative data?
- What are the strengths and weaknesses of these kinds of data?
- What is the difference between primary and secondary data?
- Can you evaluate these kinds of data?
- Why do psychologists use meta-analyses? Give an example of this type of research.
- What is an 'effect size'?
- Explain a strength and a weakness of meta-analyses.

Kinds of Data

When psychologists conduct their studies they collect data. This data include words, numbers, images, sounds, etc. without context. Data analysis is the process of turning data into information by adding context (i.e. meaning).

Qualitative data Vs quantitative data

TASK 1: Read the definitions of quantitative and qualitative data and then **choose 3 word prompts for each**:



Quantitative data is expressed numerically. It usually involves data such as individual scores from participants i.e. the number of words a participant can accurately recall in a memory experiment.

Research using this data aims to produce results that can be easily compared and analysed e.g. through being converted into graphs.

Quantitative data produces results that may also be analysed statistically to see if an observed difference or relationship is significant.

Qualitative data is non-numerical and is most often expressed in words, such as a written description of thoughts, feelings and opinions. Transcription of an interview, an extract from a diary or notes from a counselling session would all be classed as qualitative data.

Research using this data aims to produce results which are meaningful and to understand phenomena from the point of view of an individual.

Qualitative methods are those concerned with the interpretation of language, e.g. unstructured interviews and observations.

3 word prompts for 'quantitative'	3 word prompts for 'qualitative'
1. 2. 3.	1. 2. 3.

TASK 2: Decide whether the following are **strengths** or **weaknesses** of qualitative or quantitative research:

A. can produce graphs from the data	**strength/weakness**	**qualitative/quantitative**
B. can oversimplify complex behaviour	**strength/weakness**	**qualitative/quantitative**
C. represents the complexity of human experience	**strength/weakness**	**qualitative/quantitative**
D. can gain deeper access to thoughts and feelings	**strength/weakness**	**qualitative/quantitative**
E. more likely to be objective (or less biased)	**strength/weakness**	**qualitative/quantitative**
F. participants have freedom of expression	**strength/weakness**	**qualitative/quantitative**
G. easy to analyse as averages and ranges can be produced	**strength/weakness**	**qualitative/quantitative**
H. results from different studies can be more easily compared with each other	**strength/weakness**	**qualitative/quantitative**
I. data is more rich and meaningful and therefore has greater *external validity* (i.e. be more representative of 'real life')	**strength/weakness**	**qualitative/quantitative**
J. Difficult to draw conclusions and detect patterns	**strength/weakness**	**qualitative/quantitative**
K. Can be affected by subjective analysis (researcher bias)	**strength/weakness**	**qualitative/quantitative**
L. Easier to draw conclusions from data	**strength/weakness**	**qualitative/quantitative**
M. Phenomena can be forced to fit a set measure	**strength/weakness**	**qualitative/quantitative**

Primary Vs Secondary Data

TASK 3: Use two colours (or patterns) to distinguish between the characteristics of PRIMARY data and SECONDARY data:

This data is also known as field research.

This data could be found in journal articles, books or websites.

This data might have already been subject to statistical testing

Information that has been obtained first hand by the researcher.

In psychology, this kind of data is gathered directly from participants using one or more methods, e.g. experiments, questionnaires or observations.

Information that has already been collected by previous researchers

This is also known as 'desk research'

Information contained in a government census is an example of this data

TASK 4: Fill in the gaps to complete the **evaluation (AO3)** points for primary and secondary data:

PRIMARY DATA AO3

The main strength of primary data is that it is .....data, ... from participants themselves for a particular purpose. Research can be designed in such a way that it specifically targets the information required for the research question.

A problem with primary data is that it requires ..... and effort in ....., preparing and carrying out the research.

SECONDARY DATA AO3

The main strength of secondary data is that it is ..... to obtain and requires ..... effort. Findings from previous investigations can mean that current researchers may not need to carry out another experiment and simply use the secondary data.

A problem with secondary data is that it could be ..... and irrelevant despite at first looking useful. ..... information could also vary in ..... and accuracy.

Inexpensive time quality minimal authentic

Current Outdated planning direct

Meta-analysis and Effect Size

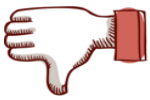
Meta-analysis can be thought of as 'research about research.' It is a particular form of research method that uses secondary data from a **large number** of studies. These studies have involved the same research questions and methods of research. **Results from the studies are combined and analysed** to provide an overall view.

When researchers carry out a meta-analysis, they may simply discuss the findings/conclusions of the studies. This would involve **qualitative** analysis.

They may additionally perform a **quantitative** analysis of the combined data, calculating what is known as the **effect size**. Effect sizes calculate the size of associations or the size of differences across studies. They are a useful descriptive statistic that can tell researchers whether the effect they have observed is either large, medium or small.

So, whereas statistical significance tells us the probability that an observed difference between two groups is down to chance (e.g. $p \leq 0.05$), the effect size tells us how meaningful (large or trivial) the difference is.

A study by Kohnken *et al*. (1999) illustrates the use of meta-analyses. These researchers combined the results from 50 studies of the enhanced cognitive interview (ECI), finding a large effect size for an increase of correct information with the ECI as compared to the standard interview used by police.

	By pooling the data of studies, meta-analyses result in a much larger sample size than individual studies. This increases the extent to which generalisations can be made and, in turn, increases the validity of conclusions.
	Researchers may not select all relevant studies, leaving out negative or non-significant results (publication bias). Therefore, the data may only represents some of the data and incorrect conclusions are drawn. This bias is sometimes referred to as the 'file drawer problem.'

Exam Practice: Kinds of Data

Specimen AS Paper 1 second set

Read the item and then answer the questions that follow.

A child psychologist carried out an overt observation of caregiver-infant interaction. She observed a baby boy interacting separately with each of his parents. Using a time sampling technique, she observed the baby with each parent for 10 minutes. Her findings are shown in **Table 1** below.

Table 1: Frequency of each behaviour displayed by the infant when interacting with his mother and when interacting with his father

	Gazing at parent	Looking away from parent	Eyes closed	Total
Mother	12	2	6	20
Father	6	10	4	20
Total	18	12	10	40

9.3 Which **one** of the following types of data best describes the data collected in this study? Shade **one** box only.

- A Primary data
- B Qualitative data
- C Secondary data
- D Continuous data

Specimen AS Paper 2 second set

Two researchers obtained a sample of ten people whose ages ranged from 20-years-old to 60-years-old. Each participant was asked to take part in a discussion of social care issues. This included discussion about who should pay for social care for elderly people and how to deal with people struggling with mental health problems. A confederate of the researchers was given a script to follow in which a series of discussion points was written for the confederate to introduce. Each participant then came into a room individually and the discussion with the confederate took place. The maximum time allowed for a discussion was 30 minutes. The researchers observed the discussions between the confederate and participants and rated the active engagement of the participants in the discussion. The ratings were between 1, (not at all interested) and 20, (extremely interested.) The researchers believed that the rating provided a measurement of the participants' attitudes towards social care issues.

The following data were obtained in the study:

Table 2: The relationship between age and attitude to social care

Age of participant	Attitude to social care issues rating
21	5
23	3
34	8

36	12
40	10
47	13
52	17
53	15
58	18
60	20

12.7 Identify the qualitative and quantitative data collected in this study. Explain your answer. (4 marks)