Sociology Factsheet

www.curriculum-press.co.uk Number 62

# Quantitative Research

**This Factsheet considers the nature and analysis of quantitative data including its strengths and its weaknesses.**

**What is quantitative data?**

- Quantitative data is expressed in numerical format.
- Favoured by sociologists who wish to take a scientific approach - positivists
- Involves the systematic collection of data
- Quantitative data is more likely to be drawn from closed questions and experiments.

Some sociologists believe that quantitative research methods are essential. Unless human behaviour can be translated into numerical terms, it cannot be measured and compared. Evidence must be collected in an organised, structured fashion by applying the principles of scientific enquiry to the study of human behaviour.

## Research methods that use Quantitative Techniques

Quantitative data can be obtained using many different methods.

**1. Questionnaires**. A set of written questions given to all participants

A good example of research that uses a questionnaire is the census. The British census is conducted every 10 years; the last one being conducted on April 29th 2001. The questionnaire is distributed to every household. In 2001 it had a section for the listing of household members, and 10 questions about housing. There was a section on the relationship of the household members to one another, and up to 35 questions for each household member. For more information about the census see www.statistics.gov.uk/census2001

**2. Interviews** which involve asking questions to participants. Interviews can be either:

Structured interviews with set questions
OR
Unstructured interviews with no set questions

The General Household Survey (GHS) is produced annually by the Office of Population Censuses and Surveys. The survey started in 1971 and has been carried out continuously since then, except for breaks in 1997/98 (when the survey was reviewed) and 1999/2000 when the survey was re-developed. A sample of approximately 13,000 addresses is selected each year from the Postcode Address File. All adults aged 16 and over are interviewed in each responding household. The interview covers areas such as family life, housing, employment and health. For more information of the GHS look at http://www.statistics.gov.uk/ssd/surveys/general_household_survey.asp

***Exam Hint:*** *It is important that you can explain the terms quantitative and qualitative and that you can explain the difference between them. Remember qualitative data is concerned with letters/words while quantitative data is concerned with numerical data.*

**3. Experiments.** A study in a an environment where variables are controlled.

In research conducted by Stewart, participants were asked to rate the physical attractiveness of 74 defendants in criminal court, covering a broad range of offences. For 67, attractiveness was predictive of both minimum and maximum sentences - the more attractive the defendant, the less severe the sentence imposed.

***Exam Hint:*** *You may be asked to explain quantitative methods and to do this you would need to use examples of the different methods that would provide quantitative data. Using examples would clearly show that you understand quantitative methods.*

## What are the advantages and disadvantages of Quantitative data?

**Advantages**

- **Test hypotheses**. Numerical data allows hypotheses to be tested
- **Study trends**. Numerical data allows for trends to be identified
- **Reliable.** Quantitative methods can be repeated by other researchers with consistent results
- **Make comparisons**. Numerical data is easy to compare
- **Establish causality** Numerical data allows causality to be shown
- **Easy to analyse**. Numerical data is easy to analyse
- **Representative**. Large scale social survey methods aim to generalise to the larger group to which the sample belongs
- **Objective**. The scientific methods of quantitative research means that the investigation should be free from personal and political opinion and prejudice

**Disadvantages**

- **Lack of depth**. Quantitative methods sometime do not give people opportunity to say what they really mean
- **No meaning**. Any meanings and feelings are hidden behind the numerical data
- **No focus on the individual**. Data is summarised collectively and does not look at individual responses
- **Distorts reality**. As data is summarised collectively and statistically, the true picture can be distorted

**Overcoming weaknesses of quantitative research**
Triangulation may be used to give more credibility and depth to quantitative research findings.

Triangulation is the use of more than one research method when carrying out a piece of research so that the different kinds of data complement each other.

**Using triangulation to study AIDS**
A report produced by The Global Fund for AIDS, Tuberculosis and Malaria (GFATM), 2008 World Health Organisation (WHO) and Joint United Nations Programme on HIV/AIDS (UNAIDS), showed how triangulation could be used to develop a better understanding of health crises.

The HIV/AIDS pandemic is one of the most complex public health crises in recent history. No single data source can fully explain the status and direction of the epidemic. However, research studies, surveillance projects and prevention, treatment, care and support programmes have accumulated a massive amount of data over the past decade.

In 2002, the Government of Botswana rolled out a national programme for the treatment of AIDS with antiretroviral therapy (ART). In 2005, the impact of this ART scale-up programme was assessed by the National AIDS Committee of the Botswana Ministry of Health (MOH), together with the World Health Organisation (WHO), the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the University of California, San Francisco's (UCSF) Institute for Global Health.

In order to determine the impact of the ART and prevention of mother-to-child transmission (PMTCT) scale-up programmes, triangulation was used.

Preliminary results indicated that, during the three years since its inception, the ART programme in Botswana has reduced mortality in adults aged 25–54 years. They also found that early initiation of district ART programmes and the overall rate of ART uptake in the district were associated with reduced mortality.

The benefits of the triangulation methodology as applied in Botswana were twofold.

First, the use of pre-existing data sources allowed the study to be conducted and concluded relatively rapidly. This is of particular importance for studies with significant policy or programmatic implications. Second, the systematic collection and examination of data from many different sources revealed new questions to be studied, and reduced the likelihood of data and researcher bias.

**Test yourself**
Why was the aim of this research?
What were the benefits of using triangulation?

## Theoretical perspective: Positivists favour quantitative data

These sociologists believe that sociology is a science. They produce quantitative data and seek generalisation from the data. Positivist sociologists believe that quantitative research methods are essential.

Unless human behaviour can be translated into numerical terms, it cannot be measured and compared. Without quantitative data, conclusions are little better than impressions and opinions. Evidence must be collected in an organised, structured fashion by applying the principles of scientific enquiry to the study of social behaviour.

This usually involves carrying out social surveys using questionnaires (a set of written questions where people are asked to write down their answers) or structured interviews (a set of written questions read out by an interviewer who write down the answers people give)

## Analysis of quantitative data

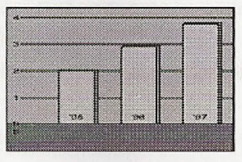
**There are several ways of analysing quantitative data**

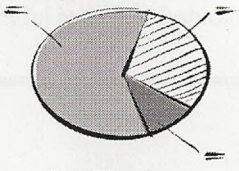
### Descriptive statistics

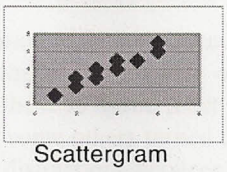
The data can be displayed in 'picture format' including

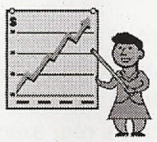
**1. Tables**
Tables are a good way of summarising quantitative data

**2. Graphs**
Graphs may take many different formats:


Bar Charts


Pie Charts


Scattergram


Frequency Polygon

## Numerical statistics

**1. Measures of Central tendency**
These are averages and provide a good summary of the data collected.

**There are three averages :**

- **Mean** - is found by adding all the individual numbers concerned and dividing by how many numbers there were.
- **Median** - To find the median, line up all the numbers concerned in order. The middle number (or the average of the two middle numbers) is the median.
- **Mode** - is the value that occurs the most frequently in a set of data.

**2. Measures of dispersion**

- Range - The difference between the greatest data value and the least data value
- Standard deviation - is a simple measure of dispersion of a population.

**3. Inferential statistics**
Statistical tests can be used to assess whether the data collected is significant. There are many different tests available depending on the type of data collected.

## Example Exam Questions

(a) Explain what is meant by quantitative data.

**Examiner's comments**
Most of candidates were able to accurately explain the concept of 'quantitative data'. Better answers offered a clear and succinct definition, referring to the data being numerical. Many displayed a range of knowledge and understanding of the term by adding examples of quantitative data, making theoretical links, or explaining advantages/disadvantages. The vast majority of candidates offered a core definition, followed by an appropriate example. Low scoring canidates usually confusing quantitative data for qualitative data.

(b) Identify and briefly explain **two** disadvantages of using quantitative methods

**Examiner's comments**
Better candidates cited the lack of validity, problems of depth and meaning, inflexibility and constructing a reality. However, some candidates failed to explain the disadvantage identified. For example, it is common for candidates to elaborate or show a consequence of the disadvantage, as with .... so there will be a lack of validity. This isn't an explanation. Some candidates incorrectly gave advantages of quantitative methods and thus scored no points. Some also gave disadvantages of qualitative data.

(c) Briefly examine the view that what quantitative methods lack in validity they make up for in reliability.

**Examiner's comments**
The most common response was to examine the statements from each theoretical stance and to elaborate on issues by citing examples of or from research. The debate seemed well understood. The factor that differentiated very good from weaker responses tended to be the ability of candidates to discuss, explore and evaluate quite complex abstract concepts in a meaningful and clear fashion. Many weaker candidates simply ended up repeating or reworking phrases from the question .

(d) Evaluate the usefulness of quantitative methods in sociological research.

**Examiner's comments**
Most answers dealt with advantages and disadvantages considered in relation to data produced without reference to the nature of the research or topic area. Better candidates identified and discussed the use of a range of quantitative methods, including questionnaires, unstructured interviews. Some candidates diverted from these to spend most of their answer on a discussion of quantitative data and, going still further away from the original question, some others turned their response into a sociology as a science answer. Disappointingly many candidates were confused by the distinctions between quantitative and qualitative: often using the terms interchangeably.

Better answers came from candidates who could examine a range of quantitative methods. Less successful candidates did this with a focus solely on the practical advantages and disadvantages of each method in turn or a general juxtaposition between quantitative and qualitative methods. Stronger candidates covered much of the same ground but were able to link this to practical, theoretical and ethical issues relating to the types and choice of method. The stronger candidates took this a stage further by offering a range of relevant examples and illustrations to show how and why certain methods might be useful and in what context.

***Acknowledgements:*** *This Sociology Factsheet was researched and written by Rosie Owens.*

***ISSN 1351-5136***

**Test Yourself**

1. Identify and describe three methods which you could use to collect quantitative data.

1. .....

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2. .....

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3. .....

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2. Explain the difference between qualitative and quantitative data

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3. Identify three strengths of quantitative research.

1. .....

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2. .....

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3. .....

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4. Identify three weaknesses of quantitative research.

1. .....

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2. .....

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3. .....

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5. Explain how the weaknesses of quantitative data could be overcome.

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