Kumar: Research Methodology

Data Collection: Issues

Prepared by Stephanie Fleischer

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Kumar: Research Methodology Chapter 10

Collecting Data Using Attitudinal Scales

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Topics covered

- Attitudinal scales in research
- Function of attitudinal scales
- Developing attitudinal scales
- Types of attitudinal scales
  - Likert scale
  - Thurstone scale
  - Guttman scale
- Attitudinal scales and measurement scales

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Attitudinal scales in research

- Helps to find out how people feel towards certain issues and situations (level of satisfaction, agreement, positive/negative attitude, etc.)
- Quantitative research explores types of attitudes, how many people have a certain attitude and intensity of attitude
- Qualitative research explores the spread of attitudes and establish types of attitudes
- Attitude scales are prevalent in quantitative research such as the Likert scale

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Function of attitudinal scales

- Measure of intensity of respondents' attitudes toward the various aspects of a situation or issue
- Provide techniques to combine the attitude toward different aspects into on overall indicator

Developing attitudinal scales

1. Which aspects of a situation or issue should be included when seeking to measure an attitude towards an issue or problem?

2. What procedure should be adopted for combining the different aspects to obtain an overall picture?

3. How can one ensure that a scale really is measuring what it is supposed to measure?

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Types of attitudinal scales

- The summated rating scale, also known as the Likert scale;

- The equal-appearing interval scale or differential scale, also known as the Thurstone scale;

- The cumulative scale, also known as the Guttman scale.

Likert Scale

- Most common attitudinal scale
- Measures intensity of attitude toward an issue
- Each statement has equal attitudinal value
- Measures in categories or on a numerical scale
- 1, 2 or 3 dimensions of attitudes (e.g. 2 as in positive and negative)
- Scores will be assigned to the attitude scale if calculations are used for weighting responses

Figure 10.1 An example of a categorical scale

The lecturer:	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
1 Knows the subject well	☐	☐	☐	☐	☐
2 Is unenthusiastic about teaching	☐	☐	☐	☐	☐
3 Shows concern for students	☐	☐	☐	☐	☐
4 Makes unreasonable demands	☐	☐	☐	☐	☐
5 Has poor communication skills	☐	☐	☐	☐	☐
6 Knows how to teach	☐	☐	☐	☐	☐
7 Can explain difficult concepts in simple terms	☐	☐	☐	☐	☐
8 Is hard to approach	☐	☐	☐	☐	☐
9 Is liked by some students and not by others	☐	☐	☐	☐	☐
10 Is difficult to get along with	☐	☐	☐	☐	☐

Figure 10.1 An example of a categorical scale

Figure 10.2 An example of a seven point scale

The lecturer:

		7	6	5	4	3	2	1
1	Knows the subject well	7	6	5	4	3	2	1
2	Is enthusiastic about teaching	7	6	5	4	3	2	1
3	Shows no concern for students	7	6	5	4	3	2	1
4	Demands too much	7	6	5	4	3	2	1
5	Communicates well	7	6	5	4	3	2	1
6	Knows how to teach	7	6	5	4	3	2	1
7	Can explain difficult concepts in simple terms	7	6	5	4	3	2	1
8	Is seldom available to the students	7	6	5	4	3	2	1
9	Is liked by some students and not by others	7	6	5	4	3	2	1
10	Has published a great deal	7	6	5	4	3	2	1

Figure 10.2   An example of a seven-point numerical scale

Figure 10.3 An example of a scale with statements reflecting varying degrees of an attitude

1: The lecturer

(a) knows the subject *extremely well*
(b) knows the subject *well*
(c) has an *average* knowledge of the subject
(d) *does not know* the subject
(e) has an *extremely poor knowledge* of the subject

Figure 10.3   An example of a scale with statements reflecting varying degrees of an attitude

Other scales

Thurstone scale:

- Calculates an attitudinal value for each statement
- Mean score is recorded for each statement
- The mean score is equivalent to the attitudinal value assigned by a group of judges
- Reflects absolute rather than relative attitudes

Guttman scale:

- Cumulative scale which is rarely used

Attitudinal scales and measurement scales

Table 10.1 The relationship between attitudinal and measurement scales

Table 10.1 The relationship between attitudinal and measurement scales

Attitudinal scales	Measurement scales
Likert scale	Ordinal scale
Thurstone scale	Interval scale
Guttman scale	Ratio scale

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Chapter 11

Establishing the Validity and Reliability of a Research Instrument

Prepared by Stephanie Fleischer

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Topics covered

- The concept of validity
- Types of validity
- The concept of reliability in quantitative research
- Factors affecting the reliability of a research instrument
- Methods of determining the reliability in quantitative research
- Validity and reliability in qualitative research

The concept of validity

Validity is the ability of a research instrument to measure what it is designed to measure

"Validity is defined as the degree to which the researcher has measured what he has set out to measure" (Smith 1991, 106)

"The commonest definition of validity is epitomised by the question: Are we measuring what we thing we are measuring?" (Kerlinger, 1973, 457)

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Types of validity in quantitative research

Face and Content validity based on subjective logic

- Face validity: Logic link between research instrument and an research objective
- Content validity: All aspects of the issue being measured

Concurrent and Predictive validity based on types of comparison

- Concurrent validity: Judged by how well an instrument compares with a second assessment concurrently done (validity coefficient)
- Predictive validity: Judged by the degree to which an instrument can forecast an outcome

Construct validity based on statistical
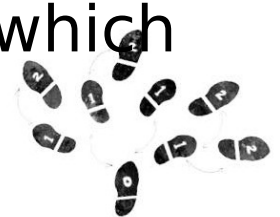
The concept of reliability

- The research tool is consistent, stable, predictable and accurate when used repeatedly

" A scale or test is reliable to the extent that repeat measurements made by it under constant conditions will give the same result" (Moser & Kalton, 1989, 353)

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Factors affecting the reliability of a research instrument

- The wording of questions
- The physical setting
- The respondent's mood
- The interviewer's mood
- The nature of interaction
- The regression effect of an instrument

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Methods of determining the reliability in quantitative research

External consistency procedures:

- Test and retest (the instrument is compared with itself)

- Parallel forms of the same test (two instruments measure the same issue)

Internal consistency procedures:

- The split-half technique (if measuring attitudes statements are divided in half and scores are correlated)

Validity and reliability in qualitative research

Trustworthiness and authenticity

Four indicators that reflect validity and reliability in qualitative research:

- Credibility
- Transferability
- Dependability
- Confirmability

Table 11.1 from Trochim and Donnell

Table 11.1 Criteria for judging research

Traditional criteria for judging quantitative research	Alternative criteria for judging qualitative research
Internal Validity	Credibility
External Validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

(Trochim and Donnelly 2007: 149)

Summary

- Validity and reliability is used differently in quantitative and qualitative research
- Concepts of validity and reliability relate more to quantitative research
- Validity refers to whether a research instrument measures what is set out to measure
- Reliability refers to an instrument that produces consistent measurement each time
- There are not set procedures for validity and reliability in qualitative research

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Chapter 12

Selecting a Sample

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Topics covered

- Differences in sampling in quantitative and qualitative research
- Definition of sampling terminology in quantitative research
- Principles of sampling
- Types of sampling
- Sample size
- Concept of saturation point in qualitative research

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Differences in sampling in quantitative and qualitative research

Quantitative research

- Unbiased
- Representative
- Make inferences
- Random samples
- Large sample sizes

Qualitative research

- Ease of access
- Purpose driven
- Information rich respondents
- A few cases until saturation is reached

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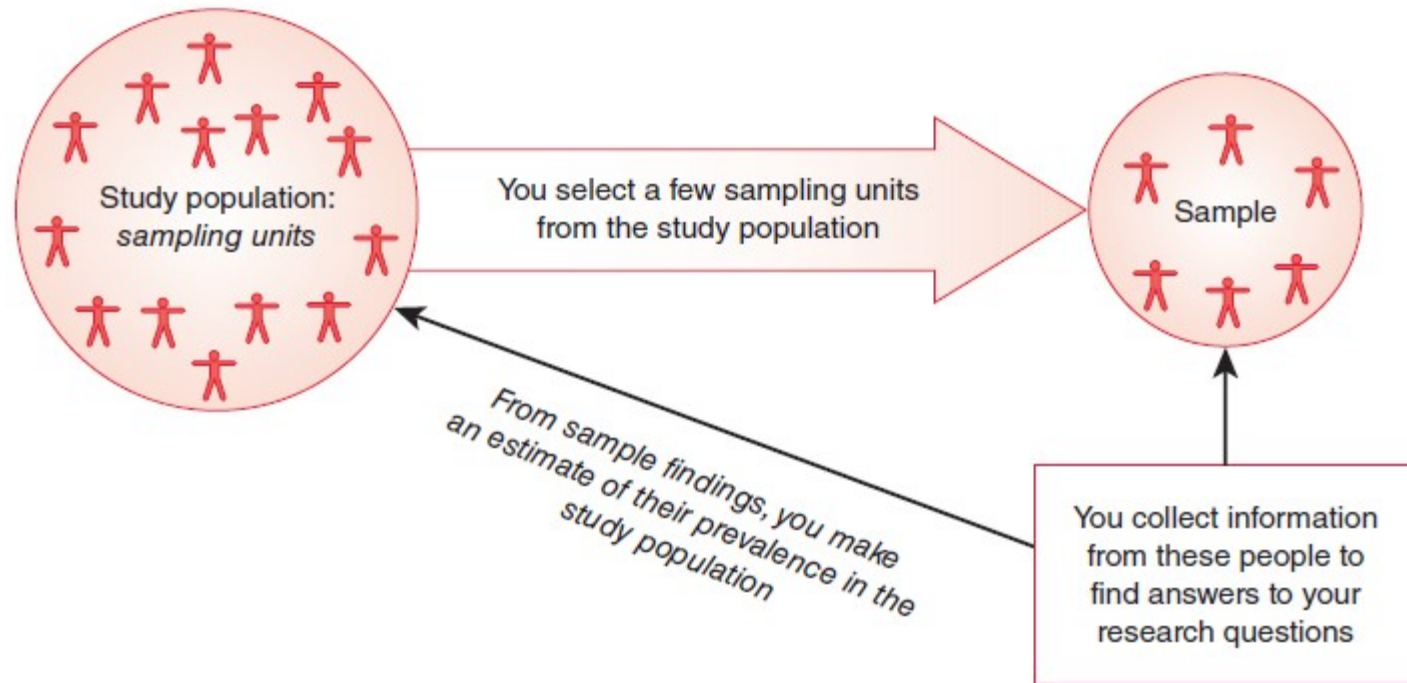# Figure 12.1 Principles of sampling

Figure 12.1 The concept of sampling

Sampling in quantitative research

Sampling is the process of selecting a few (a sample) from a bigger group (the sampling population) to become the basis for predicting an outcome for the bigger group.

- Advantage: Researching a sample is easier

- Disadvantage: The sample and the sampling population differ

Sampling terminology

- **Study population** is the group the sample is taken from
- **Sample size** refers to the number of items/people in the sample
- **Sampling frame** is a list of each item/person in the study population
- **Sample statistics** are the results found in the sample
- **Population parameter** are the estimates for the population from the sample statistics

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Principles of Sampling

1. *There will be a difference between the sample statistics and the true population mean, which is attributable to the selection of the units in the sample.*

2. *The greater the sample size, the more accurate the estimate of the true population mean.*

3. *The greater the difference in the variable under study in a population, for a given sample size, the greater the difference between the sample statistics and the true population mean.*

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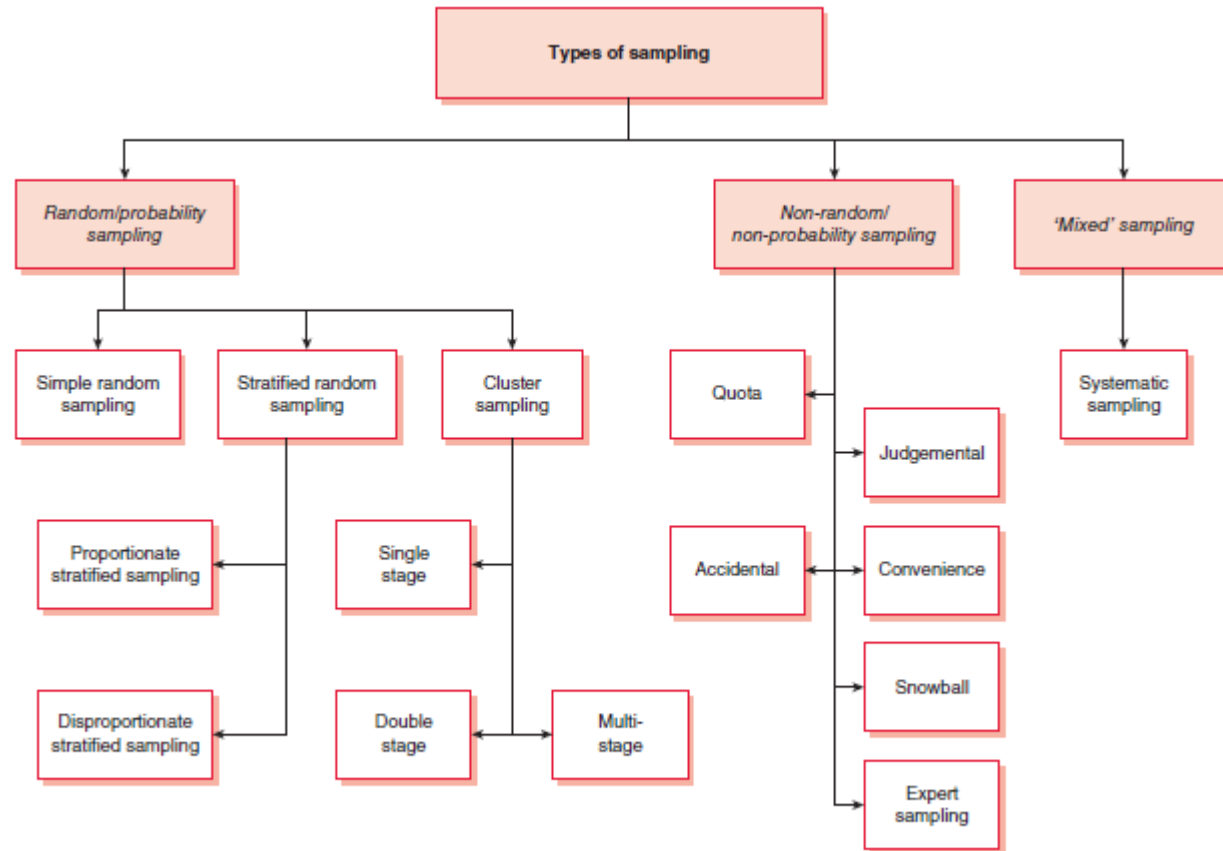
Figure 12.2 Types of sampling

Figure 12.2 Types of sampling in quantitative research

Random/Probability sampling designs

Each element in the sampling frame has an equal and independent chance of selection in the sample

Advantages:

- Representative of the total sampling population, the inferences drawn from such samples can be generalised to the total sampling population.

- Some statistical tests based upon the theory of probability can be applied only to data collected from random samples.

Specific random sampling designs

- Simple random sampling (SRS)
- Stratified random
- Cluster sampling
- Systematic sampling

Non-random/ non-probability sampling designs

- Quota sampling
- Accidental sampling
- Judgmental or purposive sampling
- Expert sampling
- Snowball sampling

Sample size

The greater the heterogeneity or diversity in what to be found out about, the greater the number of respondents needed to contact to reach saturation point.

Cause-effect studies need to consider:

- *Level of confidence*
- *Degree of accuracy*
- *Level of variation*

Concept of saturation point in qualitative research

- Qualitative research uses non-probability sampling
- Collecting information from a predetermined number of people
- Sampling until saturation point is reached (no new information collected)
- Guided by judgment as to who is likely to provide the 'best' information.

Summary

- Quantitative research wants to represent the sampling population which is best achieved through random sampling

- Qualitative research uses non-random sampling with a purpose to collect the best information from the sample

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Chapter 14

Considering Ethical Issues in Data Collection

Prepared by Stephanie Fleischer

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Topics covered

- The concept of ethics
- Stakeholders in research
- Ethical issues to consider concerning research participants
- Ethical issues to consider relating to the researcher
- Ethical issues regarding the sponsoring organisation
- Ethical issues in collecting data from secondary sources

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The concept of ethics

- Code of conduct on how to conduct research appropriately
- Differs between disciplines and professions
  - What are these principles of conduct?
  - Who determines them?
  - In whose judgement must they be considered appropriate?

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Concept of ethics continued

Code of ethics addresses ethical practice to avoid:

– Causing harm to individuals
– Breaching confidentiality
– Using information improperly
– Introducing bias

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Stakeholders in research

Ethical issues need to be considered for all stakeholders involved in a research study:

- The research participants or subjects
- The researcher
- The funding body

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Ethical issues to consider concerning research participants

- Collecting information
- Seeking informed consent
- Providing incentives
- Seeking sensitive information
- The possibility of causing harm to participants
- Maintaining confidentiality

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Ethical issues to consider relating to the researcher

- Avoiding bias
- Provision or deprivation of a treatment
- Using inappropriate research methodology
- Incorrect reporting
- Inappropriate use of the information

Ethical issues regarding the sponsoring organisation

- Restrictions imposed by the sponsoring organisation
- The misuse of information

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Ethical issues in collecting data from secondary data

- Plagiarism
- Informed consent
- Mispresentation of data
- Misinterpretation of data
- Disclosing data source
- Using data collected by covert means

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Summary

- Conducting research requires considering ethical issues
- Researchers have to adhere to a code of conduct developed by professional practice
- Ethical issues relate to participants, researchers and sponsoring organisation involved in the research study
- Ethical issues need to be addressed in the research process to prevent harm

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