

Unit

4

Process in Conducting Research

Lesson 1. The research process

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- Stages in the research process:
 - ✓ Conceptualization – idea on the research process
 - ✓ Contextualization – putting your research in the context of others –(unit 3)
 - ✓ Data collection and analysis – (this unit addresses)
 - ✓ Reporting – writing up of your research (unit 6)

Research methods – Data collection and Analysis

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- Choose the most suitable **research method** for your study according to the approaches used.
 - ✓ Quantitative research – involving numerical and statistical data. Emphasis on quantitative observations.
 - ✓ Qualitative research – gathering non-numerical data. Emphasis on qualitative results.
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Research methods – Common Types

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- Observation studies
 - Questionnaires
 - Interviews
 - Focus groups
 - Document analysis
 - Mathematical modeling
 - The experimental method
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Research methods – Common Types

- **Observation studies**- the process of observing and recording events.
 - ✓ Especially useful for studying human or animal behavior
 - ✓ Two types – participant (observer as participant) and non-participant

E.g. Study on weight gain of selected sheep breeds which are exposed to the same environment.

Data collection:

no perfect example; varies with the type of problem

- ❖ often through writing up of notes
- ❖ may also involve taping or filming

Research methods – Common Types

- **Questionnaires** – a tool where respondents answers to questions.
- It could be open or closed/fixed.
- It is flexible and can be applied on almost any topic of research.

Data collection:

Questionnaire forms (hard copies), web based questionnaires.

E.g. Why do you apply for graduate program? – closed

1 – to expand my knowledge

2 – to earn a better salary after graduation

3 – to get promotion

4 – no specific reason

Research methods – Common Types

- **Interviews** – tools where questions are delivered in a face to face encounter.
 - ✓ It is limited to cases where the subjects of study are human.
 - ✓ It can be approached in pure quantitative (structured) and pure qualitative (not structured) angle as of questionnaire.
 - ✓ Mainly interviews are semi-structured

Data collection:

Structured one – ticking/writing on a form

Less structured data – taping and taking notes

Research methods – Common Types

- **Focus groups** – a type of interview but targeting only carefully selected individuals usually who do not know each other.

✓ It is useful in providing qualitative data.

E.g. Study on identification of corrupted politicians.

Research methods – Common Types

- **Document analysis/content analysis** – the process of using any kind of document, films, photographs, books, etc, for analysis for a particular research interest.
 - ✓ It is an indirect form of research where in original data is not generated.
 - ✓ It is a non-reactive method.
 - ✓ Reliability and validity are the central concerns

Research methods – Common Types

- **Mathematical modeling** – used to analyze relationships between different variables and to predict possible outcomes, or causal effects.

E.g. Universal Soil Loss Equation(USLE)

$$USLE = RKLSCP$$

Where,

R = rainfall factor

K = soil factor

L = slope length factor

S = degree of slope factor

C = crop factor

P = conservation factor

Research methods – Common Types

- The experimental method – involves setting up an experiment in order to test a particular theory or hypothesis.

- ✓ laboratory experiments – small scale study and subjects are studied in a controlled environment.

E.g. Nano-technology, chemistry, etc

- ✓ field experiments – research conducted outside the laboratory and researcher control of the env't is reduced.

E.g. soil related studies

Analyzing and Interpreting Quantitative Data



Steps in quantitative analysis and interpretation:

- ✓ How do you prepare the data for analysis?
- ✓ How do you analyze the data?
- ✓ How do you report the results?
- ✓ How do you discuss the results?



Analyzing and Interpreting Quantitative Data



Preparing the data for analysis?

- ✓ Score data by assigning numeric codes to responses
- ✓ Create codebook
- ✓ Create data file in data grid
- ✓ Create variable, value labels



Analyzing and Interpreting Quantitative Data



Identify types of Scores to analyze:

- ✓ Single item
 - ✓ Summed scores
 - ✓ Difference scores
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Analyzing and Interpreting Quantitative Data



Select a statistical program for quantitative studies:

- ✓ Statistical Package for Social Sciences- SPSS is most popular
- ✓ Other programs: Mini-tab, Statview, SAS, StatPac
- ✓ Use mainframe, PC or Mac platforms

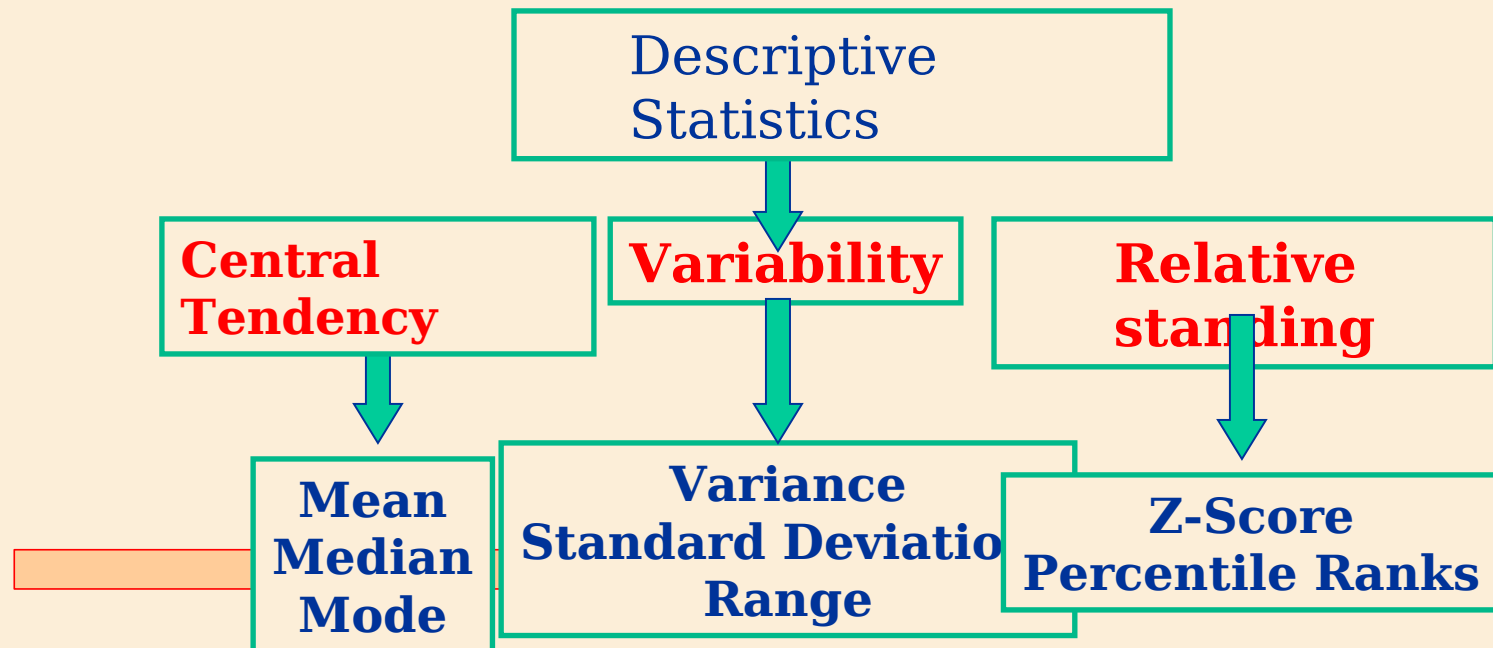


Analyzing and Interpreting Quantitative Data

How do you analyze the data?

Conduct descriptive analysis:

- ✓ Measures of central tendency
- ✓ Measures of relative standing



Analyzing and Interpreting Quantitative Data



Conduct inferential analysis:

- ✓ Hypothesis testing
- ✓ Confidence interval

Identify a null and alternative hypothesis

Set the level of significance (alpha level) for rejecting the null hypothesis

Compute the sample statistic

Make a decision about rejecting/failing to reject



Analyzing and Interpreting Quantitative Data



Parametric inferential analysis:

- ✓ Correlation coefficient and regression coefficient
 - ✓ T-test, analysis of variance, analysis of covariance
 - ✓ Chi-square analysis, etc.
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Sampling Terms and Procedures

- **Population** - inclusive group defined by researcher
- **Sample** - representative subset of population
 - should contain essential elements of population
- **Random Sampling**-process of sampling which assures that any subject in the population has an equal probability of being in the sample
- **Systematic counting**-uses list to choose every nth person from the population
- **Stratified Random**-used when researcher believes the population has distinct subgroups.
E.g.: if population has 45% men, then we make sure sample is 45% men



Thank you

