

STATISTICS AND MEASUREMENT

UNIT I

CHAPTER I DESCRIPTIVE AND INFERENCE STATISTICS

STATISTICS - MEANING

- The word statistics is derived from a Latin word “STATUS” meaning “a group of numbers or figures, that represent some information of human interest”
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➤ Statistic is a branch of mathematics that focuses on

- I. Collecting
- II. Organizing
- III. Presenting
- IV. Interpreting
- V. Analyzing

Of numerical data in large quantities, especially for the purpose of inferring from a representative sample.

WHAT IS POPULATION

A population is referred to an **entire group** of people or objects or measurements which have common characteristics that are of interest of the researcher

- I. Finite population – countable
- II. Infinite population – uncountable

WHAT IS SAMPLE

In social science research, it is not possible for the researcher to approach all the individuals in the population for the purpose of data collection. Instead they select a **representative sample**/ group of individuals **from the population**

- ✓ Sample is defined as the small portion of a population selected of a particular research
- ✓ Sample is a miniature picture of cross selection of the entire group (population) from which the sample is drawn.

TYPES OF DATA

QUANTITATIVE

QUALITATIVE

DISCRETE

Has specific values and cannot have values between those specific values

CONTINUOUS

Has values between any two values

- **Qualitative** research involves collecting and analyzing **non numerical data**.
 - To understand concepts, opinions and experiences
 - Data is collected through observation and interview
 - Data is reported in **language** format.
- **Quantitative** research involves collecting and analyzing **numerical data** for statistical analysis
 - Data collected through measuring things
 - Data reported through **statistical analysis**

TYPES OF STATISTICS

1. DESCRIPTIVE
2. INFERENCE

DESCRIPTIVE STATISTICS -

“descriptive statistics are procedures especially used to **describe** and **summarize** observed data in a **meaningful way**”

It is a **summary** statistic that **quantitatively** describes and summarizes features of a collection of information. Psychologists use descriptive statistic to **summarize** and **describe a large group** of information for research study. It is used to present quantitative descriptions in a **manageable /understandable** way.

There are 3 major techniques

- 1) **CLASSIFICATION** – the arrangement of data in groups according to similarity is known as classification.

For example -

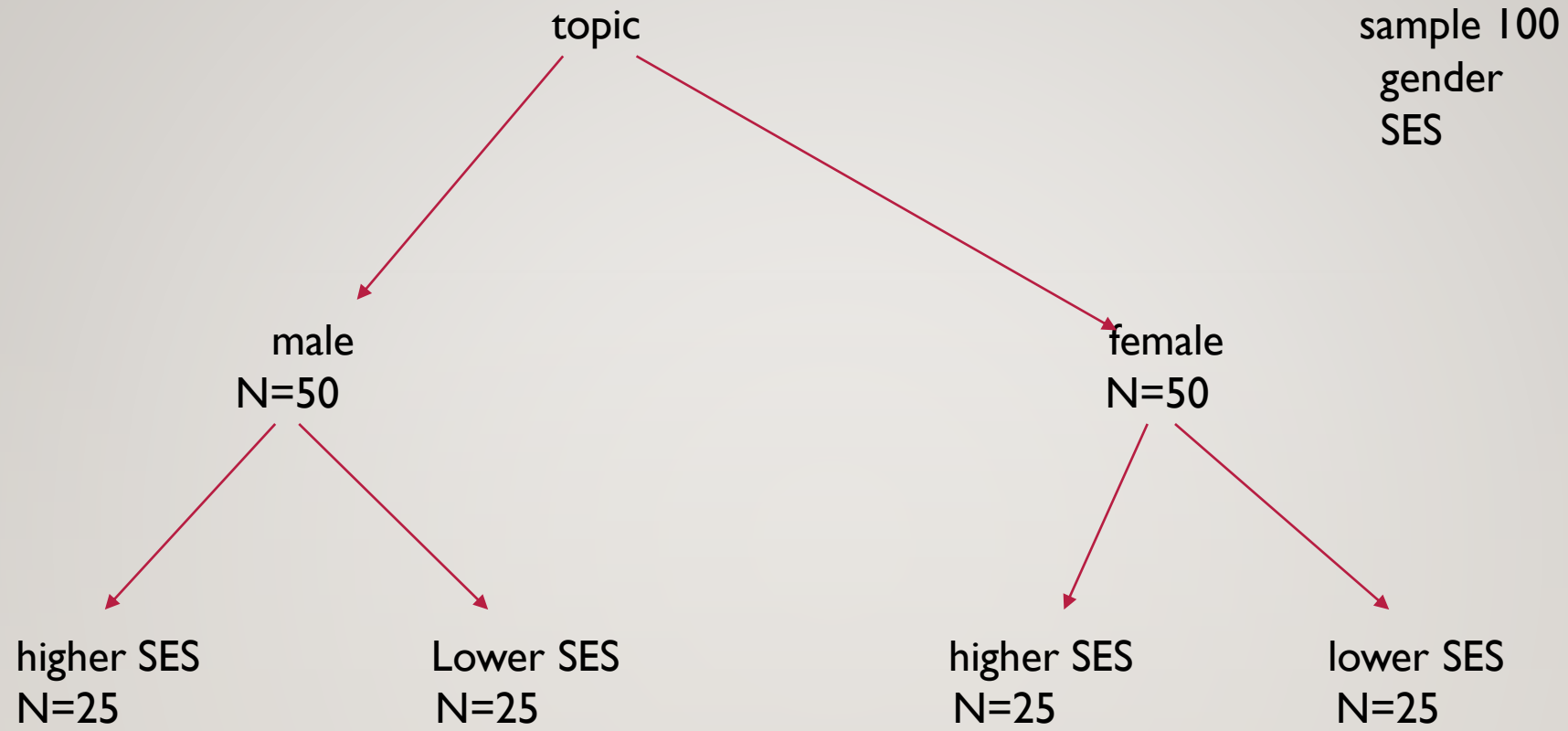


Classification is done with the following objective :

- I. Presenting the data in a condensed form
- II. Explaining the affinities and diversities for the given data (comparison)
- III. Tabulating the required comparisons
- IV. Presenting the data in frequency distribution

2) **TABULATION** – the presentation of classified data in the form of an organized table / matrix. A matrix is a systematic arrangement of classifying data in rows and columns. eg

3) **GRAPHIC REPRESENTATION** – the information contained in frequency distribution often is displayed in a graphic representation. Example – frequency polygon, bar graph, histogram, pie diagram.



INFERENCEAL STATISTICS

- Psychologists use inferential statistics to draw **conclusions and to make inferences**

“ inferential statistics are procedures used that allow researchers to **infer or generalize** observations made from the sample”

- “ inferential statistics are ways of analyzing data that allow the researcher to make conclusion about whether a **hypothesis is accepted or rejected**”



PROCEDURE FOR DRAWING INFERENCE

- I. A topic is selected
- II. The population is determined
- III. A sample is drawn
- IV. Groups are determined
- V. **Null Hypothesis** is formed/ formulated
- VI. A test is administered to the sample
- VII. Total / raw score is calculated
- VIII. Mean is calculated
- IX. Means for each group is compared
- X. Conclusion is made whether to **accept the null hypothesis or reject**

Methods used

1. Significant difference between means (t- test)
2. Regression analysis
3. Analysis of variance
4. Analysis of covariance

