Level : **Master I (LS)**

Module : **Methodology in Social Sciences**

Data Analysis

Prof. Rahmouna ZIDANE

Department of English

University of TLEMCEN

Data Analysis

❖ Data analysis means the procedure of summarizing and interpreting the collected information. It denotes an essential step in reporting the research findings. It may be qualitative or quantitative.

Quantitative *Data Analysis*

❖ Quantitative data analysis refers to the numerical form of interpreting the collected information. It involves the use of a set of statistical techniques including descriptive and inferential statistics.

Descriptive Statistics

❖ Descriptive statistics aim at describing and summarizing the gathered data. They include frequencies, percentages and measures of central tendency as well as measures of variability.

❖ Frequencies and percentages may be provided within a text or they may be represented in tables called frequency tables. Percentages may be demonstrated through graphic representation involving the use of bar-graphs or pie-charts.

Measures of Central Tendency

❖ Measures of central tendency are used for the description of the central point of a set of data. These statistics are : the mean, the median and the mode.

❖ **The mean** is the average score of a group of individuals. Its formula is as follows:

$$\bar{x} = \frac{\sum x}{n}$$

∑x= the total of scores

n= the number of scores

For instance, in the following list of scores:2, 3, 5, 6, 8, 10, 12, 14, 15, 16, the mean is (9.1).

❖ **The median** shows the middle value of a group of scores. For an odd number, the median is the middle score; for example, in a list of scores including the following values:5, 6, 8, 11, 12, 14, 15, the median is 11.

❖ For an even number, the median is the average of the two scores which are in the middle; for example, in a list of scores including the following values: 2, 3, 5, 6, 8, 10,12, 14,15,16, the median is 9 [(8+10)/2].

❖ **The mode** is the number that frequently occurs in a distribution of scores. For instance, in the following list of values:6, 8, 10, 9, 12, 8, 14, 8, 11, 8, the mode is 8.

Measures of Variability

❖ Measures of variability are statistical procedures that are employed to identify the dispersion of data around the mean; they denote the spread of a set of values . Measures of variability include the range and the standard deviation.

- **The range** refers to the difference between the highest and lowest value in a dataset. Its formula is as follows:

  Range= (largest value - smallest value)

- For example, in a list of scores including the following values:2, 3, 5, 6, 8, 10, 12, 14, 15, 16, the range is 14 (16-2).

- **The standard deviation** is a measure of variability that determines the dispersion of data; it helps to show if the values are close to or far from the mean.

The formula of the standard deviation is as follows:

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n-1}}$$

s= standard deviation

x= each score

x-bar= the mean

n= number of scores

Inferential Statistics

❑ Inferential statistics refer to the statistical procedures that are employed to draw conclusions about the features of the target population depending on the data collected from the selected sample. They aim at making predictions.

❑ Inferences can be made from quantitative data through the use of inferential statistics such as the chi-square test.

❏ **The chi-square test** is a very useful technique that helps to determine the difference between the observed and expected data. Its formula is as follows:

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

O = observed frequencies

E = expected frequencies

❖ Quantitative data analysis is an essential process that helps the researcher to summarize the research results in an accurate and objective way. It provides numerical data that can lead to make inferences related to the generalization of the findings.

Qualitative Data Analysis

➢ Qualitative analysis refers to the non-numerical type of data description and interpretation. It is based on the researcher's understanding and explanation of the findings. It focuses on the meaning of the obtained results.

Objectives of Qualitative Analysis

➢ Qualitative data analysis aims at presenting a detailed description of the investigated issue to highlight the significance of the study. It attempts to explain the studied phenomenon through the interpretation of the informants' points of view. Its main purpose is to supply enough data about the topic.

Procedures of Qualitative Analysis

- Qualitative data analysis is based on the use of various techniques depending on the nature of the collected information and purposes of research. Among these procedures, one can list: qualitative content analysis and discourse analysis.

- Qualitative content analysis refers to the interpretation of the content of the data gathered from documents, texts or responses to open-ended questions. It is useful for analysing the meaning of texts, the content of textbooks, the recorded information obtained through observation or the informants' answers to the questions of a questionnaire or an interview.

- Discourse analysis refers to the procedure utilized for the analysis of the purposes and aspects of language use in a specific social context. It helps to interpret conversations or written texts.

Steps of Qualitative Analysis

o   Qualitative data analysis involves the following phases :organizing, reviewing, coding, describing and interpreting the gathered data.

o   Organizing and preparing the collected information: this stage refers to the arrangement of the gathered data.

o   Reviewing and exploring the gathered data: this phase implies the act of reading and evaluating the amount and quality of the collected information.

o   Coding : coding refers to the classification of the gathered data into distinct categories. It means summarizing the content of each response and classifying answers together according to their content.

o   Describing : this step concerns the description of the analysed items in a detailed way.

o   Interpreting : this stage implies the explanation and interpretation of the collected information.

Qualitative Data Analysis

- ➢ Qualitative data analysis formulates textual information provided in the form of texts. To supply more explanations, the researcher may use summary tables or diagrams to summarize and recapitulate the main points listed previously within the text.

- ➢ Qualitative data analysis enables the researcher to give arguments and details. However, it may be unreliable and subjective because it is based on the informants' opinions and the investigator's point of view. Therefore, quantitative data analysis should be also used in order to supply reliable and objective results.

References

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