Statistics

Part two Lecture 4

Data analysis: Descriptive statistics

Pr. Chelli

Lecture objectives

- **Describing and summarizing data**
  - **Describing and summarizing categorical data (qualitative)**

Introduction

After having introduced statistics, including the levels of measurement available for both qualitative and quantitative research studies, the objective of this lecture is to help you describe and summarize categorical data. In other words, you will be trained in the use of descriptive statistics, which is of immense importance because it provides efficient and effective methods for summarizing and analyzing information (Mann & Lacke, 2010, p.27).

Qualitative research

According to Denzin and Lincoln (2005, p.3), qualitative research is an **interpretive naturalistic approach** to the world. It involves collecting and analyzing non-numerical data.

These types of data can be collected through focus groups, interviews, opened ended questionnaire, and other unstructured tools**.**

- After the mass of **words are generated** by any of the mentioned tools, they need to be described and summarised
- Finally, the results are **presented**, generally as a **descriptive** and **interpretive** account of the data.

Qualitative data analysis

The data we obtain is called;

1. Raw data: Data recorded in the sequence in which they are collected and before they are processed or ranked are called raw data.

After cleaning the raw data, the researcher shifts to:

2. Summarizing qualitative data by tables and graphs:

- The number of observations that fall into a particular class (category) of the qualitative variable is called the **frequency** (or count) of that class. A table listing all classes and frequencies is called a **frequency distribution.**

  * **Frequencies are simply the number of cases falling into each of the values of a variable.**

Continued

In addition to the frequency, relative frequencies can be used.

- The relative frequency is calculated by dividing the frequency in the class by the total of observations.
- It helps to know the number of something if compared to the total number.
- or the number of events that occur if compared to the total number of events.

Table 1.1: Frequency table for the category variable of sex

n= 20

Gender	Frequency	relative frequency
Male	6	6/20 0. 3
Female	14	14/20 0.7

Continued

In addition to frequencies, **percentages** can also be used.

A percentage is the number of cases out of (per) a hundred (cent) that fall in a particular category. To calculate the percentage, we need the percentage in each category and the total of these frequencies of all the categories of that variable:

Frequency of the category divided by the total frequencies x 100

Frequency of females: frequency of males and females x 100

6:20 x 100= 0.3 x 100=30%

Calculate the percentage of:

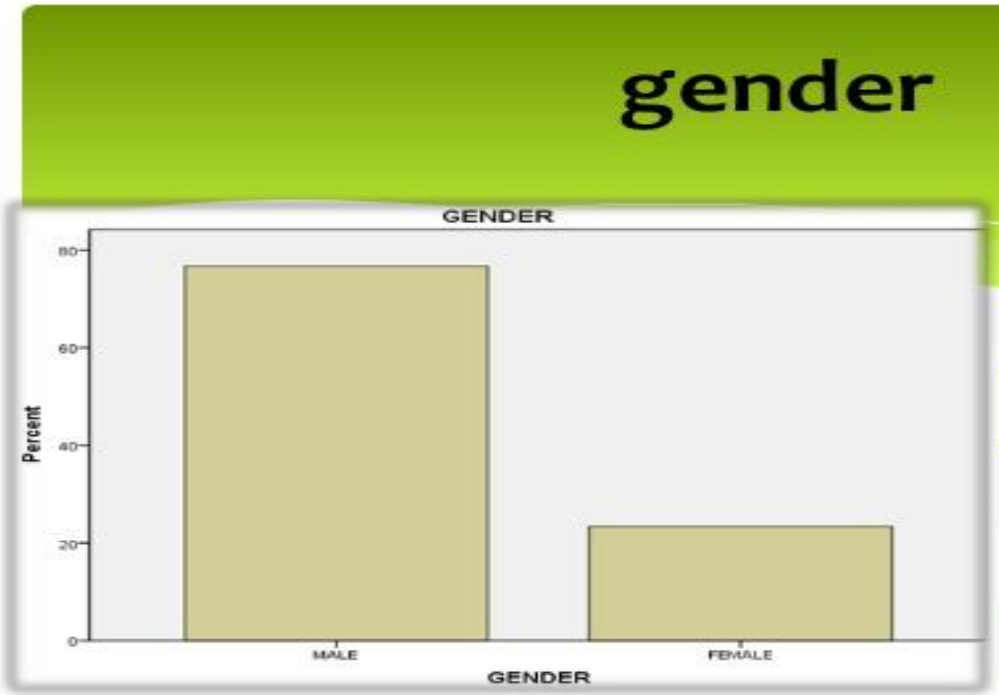
1. **15** out of 35 participants in a questionnaire answered question 1 with yes and **20** answered with **no**.

Graphical presentation of qualitative data

All of us have heard the adage ‘ a picture is worth a thousand words’. A graphic display can reveal at a glance the main characteristics of a data set. The bar graph and pie chart are two types of graphs that are commonly used to display qualitative data (Mann & Lacke, 2010, p.31)).

Refer to the graphs in Howit & Cramer (2005, pp. 46/50).)

Bar chart (graph) showing male and female employees

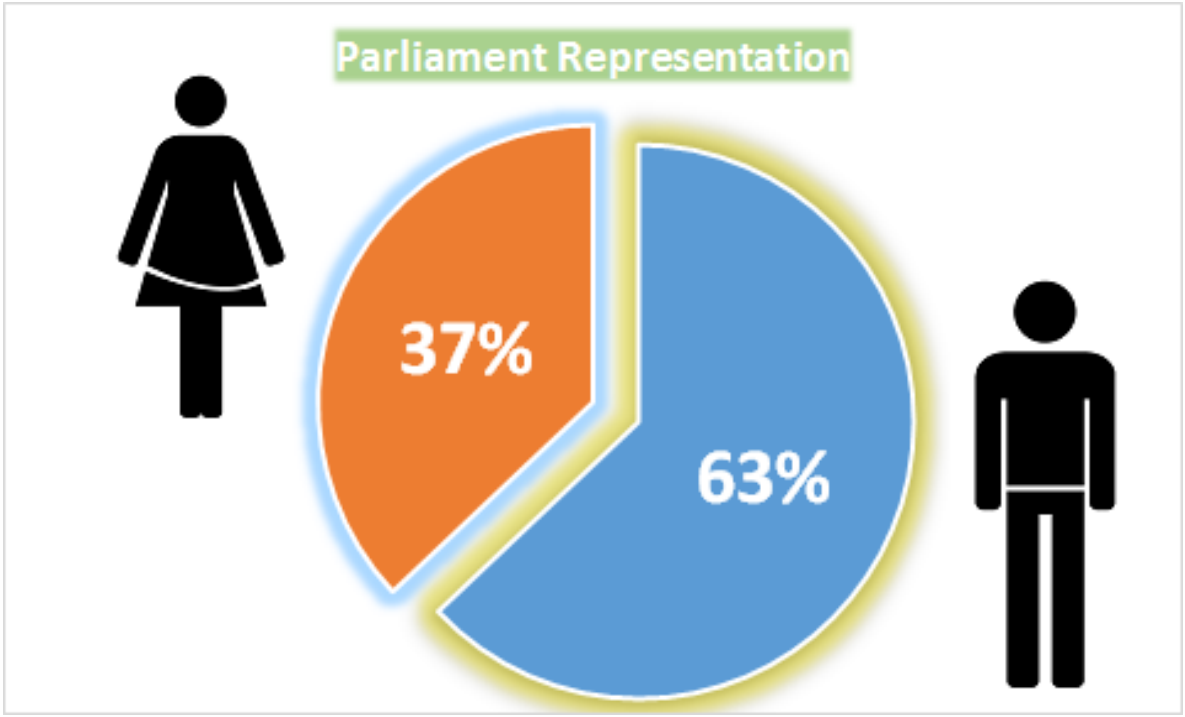


Gender	Frequency	percent
MALE	23	76.7
FEMALE	7	23.3
Total	30	100.0

The bar chart shows that,

- 76.7% of the employees are males
- 23.3% of the respondents are females

Pie chart showing percentage of male and female in the parliament



Calculation of the degree of slices

The pie chart is a circle divided into portions (slices) that represent the relative frequencies or percentages of a population or a sample belonging to different categories (Mann & Lacke, 2010, p.32).

Degree of slice= number of people in a category : total number of people in the sample x 360

The previous example seen in percentages

6: 20= 0.3 x 360= 108°

Exercise

Suppose, you used a sample of 170 students in a questionnaire.

- 150 respondents are girls and 20 are boys.
- 80 repondents answered quetion 2 with yes and 90 with no.
- 75 repondents find the use of the jigsaw technique very beneficial, 46 find it beneficial and 49 didn’t respond.

1.Calcualte the percentage and the degree of slice (pie chart angle) for each one.

2. Draw the pi chart mentioning the results (manually or use the excell)

Howit, D, Cramer,D. (2005). First steps in research and statistics: A practical workbook for psychology students. Taylor & Francis Group: Routledge

Mann. P.S, Lacke, *C.J. (2010). Introductory statistics. 7th ed. Rowan University: John Wiley &Sons.INC*