
UNIT 11 COMPUTATION OF DESCRIPTIVE STATISTICS USING SPSS*

Structure

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Computation of Frequency using SPSS
- 11.3 Computation of Descriptive Statistics using SPSS
- 11.4 Computation of Crosstabs using SPSS
- 11.5 Graphs in SPSS
- 11.6 Let us Sum up
- 11.7 References
- 11.8 Answers to Check Your Progress
- 11.9 Unit End Questions

11.0 OBJECTIVES

After reading this unit, you will be able to,

- Discuss computation of frequency using SPSS;
- describe computation of descriptive statistics using SPSS;
- explain computation of Crosstabs using SPSS; and
- discuss the graphs in SPSS.

11.1 INTRODUCTION

In the previous unit, we discussed about how SPSS file is created. We also explained the menu bar of SPSS and discussed the data view, variable view and output view in SPSS. In the present unit, we will discuss about computation of descriptive statistics using SPSS with the help of figures.

11.2 COMPUTATION OF FREQUENCY USING SPSS

To compute frequency using SPSS, the following procedure is to be followed:

- 1) Go to the main menu *Analyze* and the click on *Descriptive Statistics* and then on *Frequencies* (*Analyze > Descriptive Statistics> Frequencies*) as can be seen in figure 11.1.

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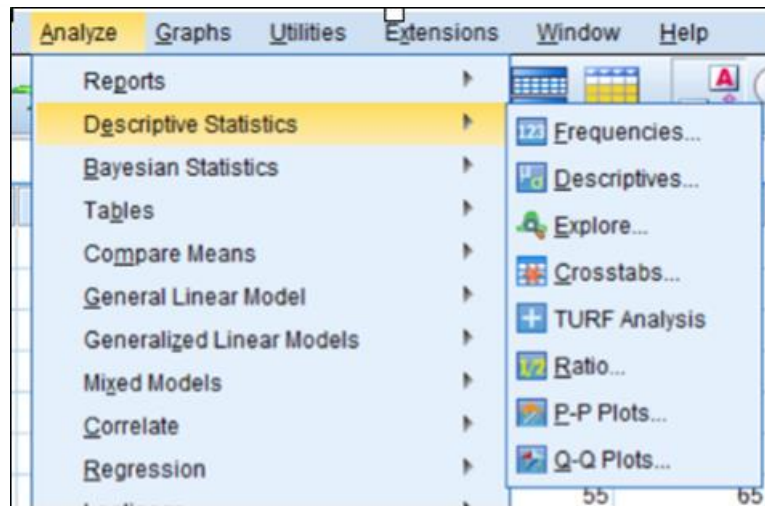


Fig. 11.1: Partial Screenshot of Main Menu Analyze> Descriptive Statistics

- 2) Once we click on **Frequencies**, the dialogue box labeled **Frequencies** as displayed in figure 11.2 will open.
- 3) Now what we need to do is select and transfer the variables for which we need to compute frequency from the white space on the left side to the white space on the right side (as can be seen in figure 11.2) with the help of the arrow given in the middle (that is circled) of the two white spaces. You can even transfer back a variable to the white space on the left side with the help of the same arrow if you decide that you don't want to continue with computation for that variable.
- 4) If further computations are required, **Statistics** can be clicked on **Frequencies** dialogue box. As that is done another dialogue box labeled **Frequencies: Statistics** will open (as can be seen in figure 11.3). In this dialogue box, we can select whichever statistics that we need to compute and then click on **Continue**.
- 5) If we need charts, we can click on **Charts** as well in **Frequencies** dialogue box (figure 11.2). That will lead to the opening of dialogue box titled **Frequencies:** as can be seen in figure 11.4. Select the chart as per the requirement and also click on whether you need the charts in **Frequency or Percentage** and click on **Continue**.
- 6) Once you click **OK** on the **Frequencies** dialogue box, the results will be displayed in the **Output view** of SPSS(the results can be seen in Box 11.1). The graph will also be displayed in the **Output view** of SPSS. the graph thus obtained can be seen in figure 11.5. In the example we have computed various statistical techniques for learning purpose. But you need to compute the statistical techniques as required based on your objectives and hypothesis/es. Please ensure that the table is not copied as it is but is done in the way that is applicable for your Results and Discussion chapter of your dissertation or part of your research paper. Ensure that you follow the points we discussed in BPCC104 regarding tabulation. Do not forget to provide appropriate titles and numbers to your tables and figures.

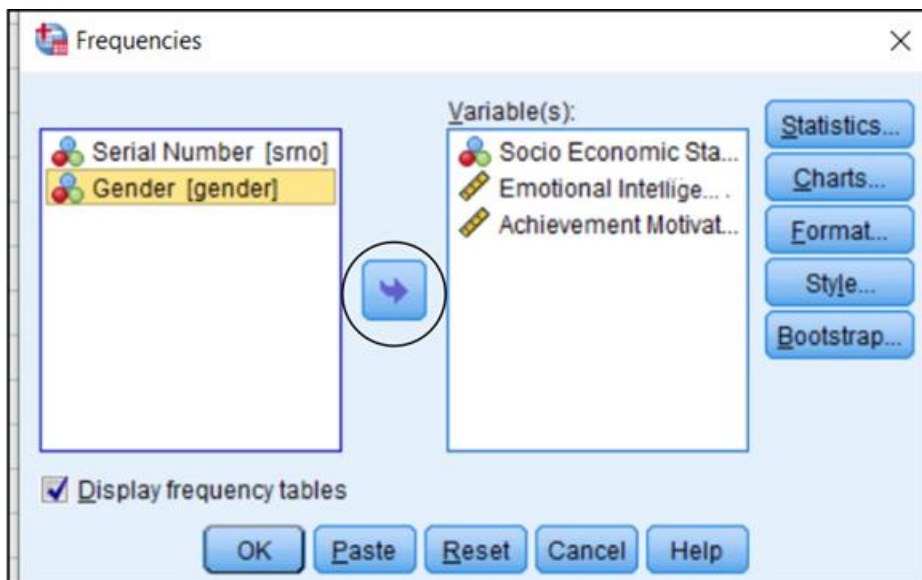


Fig. 11. 2: Frequencies Dialogue Box

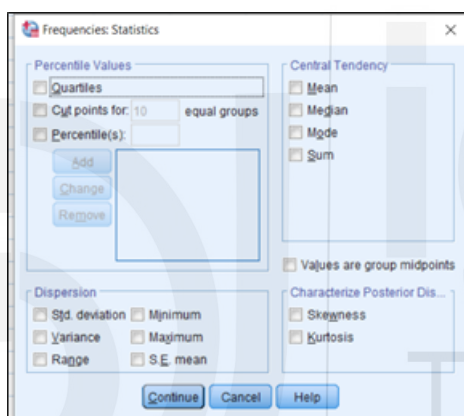


Fig. 11. 3: Dialogue Box Frequencies: Statistics

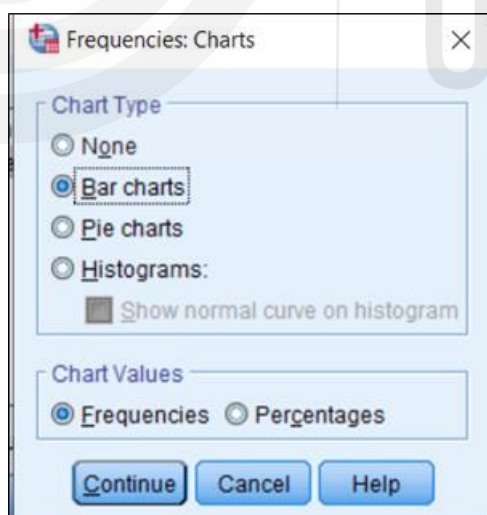


Fig. 11. 4: Dialogue Box Frequencies: Charts

Box 11.1: Results obtained after Computation of Frequencies Statistics						
		Gender	Socio Economic Status	Emotional Intelligence	Achievement Motivation	
N	Valid	20	20	20	20	
	Missing	0	0	0	0	
Mean		1.50	2.05	53.55	55.65	
Median		1.50	2.00	55.50	55.50	
Mode		1 ^a	2 ^a	45	55	
Std. Deviation		.513	.826	13.923	13.464	
Skewness		.000	-.098	-.190	-.289	
Std. Error of Skewness		.512	.512	.512	.512	
Kurtosis		-2.235	-1.518	-.220	-.704	
Std. Error of Kurtosis		.992	.992	.992	.992	
Minimum		1	1	23	33	
Maximum		2	3	77	78	
Sum		30	41	1071	1113	

a. Multiple modes exist. The smallest value is shown					
Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	10	50.0	50.0	50.0
	Female	10	50.0	50.0	100.0
	Total	20	100.0	100.0	

Socio Economic Status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Socio Economic Status	6	30.0	30.0	30.0
	Medium Socio Economic Status	7	35.0	35.0	65.0
	High Socio Economic Status	7	35.0	35.0	100.0
	Total	20	100.0	100.0	

Emotional Intelligence					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	23	1	5.0	5.0	5.0
	34	1	5.0	5.0	10.0
	43	2	10.0	10.0	20.0
	45	5	25.0	25.0	45.0
	55	1	5.0	5.0	50.0
	56	3	15.0	15.0	65.0
	65	4	20.0	20.0	85.0
	67	1	5.0	5.0	90.0
	76	1	5.0	5.0	95.0
	77	1	5.0	5.0	100.0
		Total	20	100.0	100.0

Achievement Motivation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	33	2	10.0	10.0	10.0
	34	1	5.0	5.0	15.0
	44	3	15.0	15.0	30.0

55	4	20.0	20.0	50.0
56	2	10.0	10.0	60.0
65	3	15.0	15.0	75.0
66	1	5.0	5.0	80.0
67	2	10.0	10.0	90.0
76	1	5.0	5.0	95.0
78	1	5.0	5.0	100.0
Total	20	100.0	100.0	

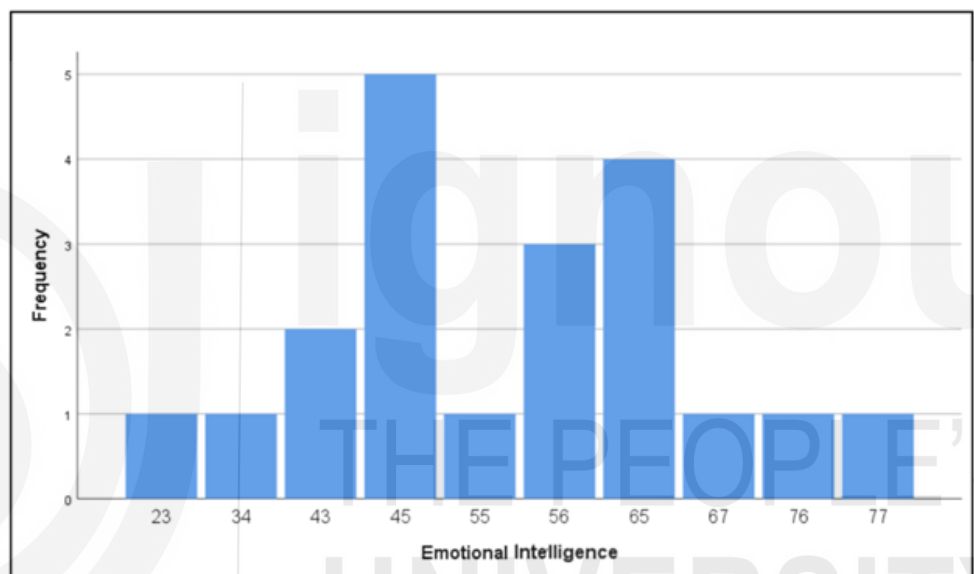


Fig. 11.5: Chart displayed in the Output View

Check Your Progress I

- 1) What is the first step in computation of frequencies in SPSS?

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11.3 COMPUTATION OF DESCRIPTIVE STATISTICS USING SPSS

Computation of descriptive statistics is similar to that of frequencies. You need to go to the main menu **Analyze** of SPSS and then click on *Descriptive Statistics* and then on *Descriptives* (refer to figure 11.1). Thus, *Analyze > Descriptive Statistics > Descriptives*.

- 1) As you click on *Descriptives*, the dialogue box labeled *Descriptives* will open. This can be seen in figure 11.6.
- 2) Then we follow a similar procedure as we did for *Frequencies* dialogue box, where we drag the variables emotional intelligence and achievement motivation from the white space on the left in the *Descriptives* dialogue box to the white space on the right with the help of the arrow given in the middle of the two spaces. You can even transfer back a variable to the left space with the help of the same arrow if you decide that you don't want to continue with computation for that variable.
- 3) In the *Descriptives* dialogue box you can also click on *Option* tab, and as you do so the dialogue box with label *Descriptives: Options* will open (refer to figure 11.7). This gives you various options of descriptive statistical techniques that you can click as per your requirement and then click on *Continue*.
- 4) Do not forget to click *OK* on the *Descriptives* dialogue box so that the computation is carried out.
- 5) The results will then appear in the *Output view* of SPSS. The table will look as can be seen in box 11.2.
- 6) The results obtained can be suitably tabulated and interpreted based on the objectives of the research.

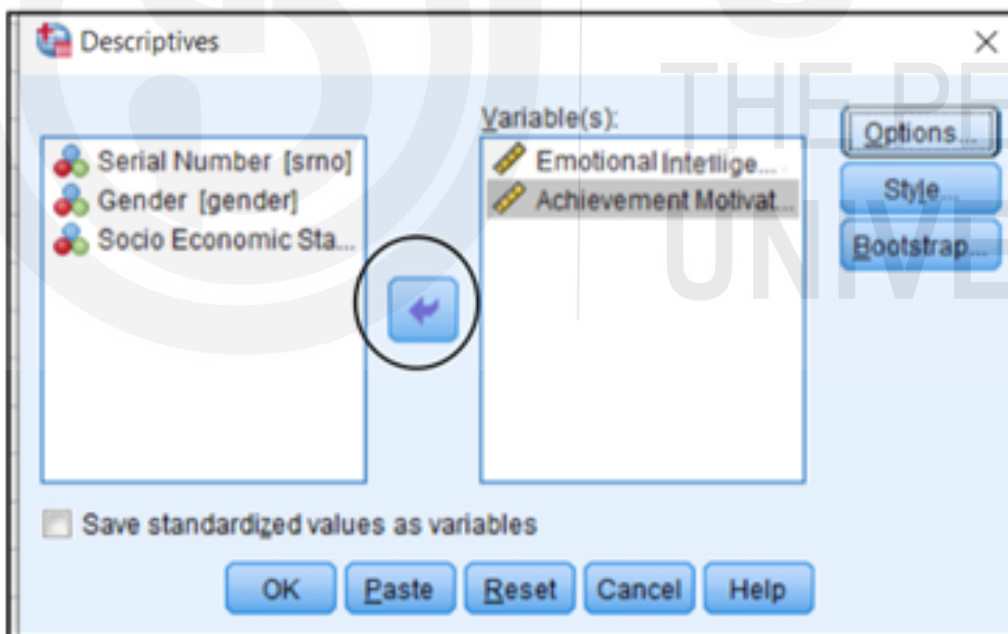


Fig. 11.6: Dialogue Box for Descriptives

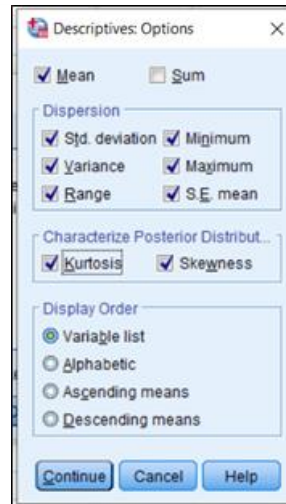


Fig. 11.7: Dialogue Box for Descriptives: Options

Box 11.2: Results obtained for Descriptive Statistics												
Descriptive Statistics												
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic	Statis- tic
Emotional Intelligence	20	54	23	77	53.55	3.113	13.923	193.839	-.190	.512	-.220	.992
Achievement Motivation	20	45	33	78	55.65	3.011	13.464	181.292	-.289	.512	-.704	.992
Valid N (listwise)	20											

Check Your Progress II

1) In Box 11,2, what is the range and mean obtained for variable emotional intelligence?

Range: _____ Mean: _____

11.4 COMPUTATION OF CROSSTABS USING SPSS

Computation of *Crosstabs* is similar to that of frequencies and descriptive statistics. You need to go to the main menu *Analyze* of SPSS and then click on *Descriptive Statistics* and then on *Crosstabs* (refer to figure 11.1). Thus, **Analyze > Descriptive Statistics> Crosstabs**.

The following procedure is then to be followed:

- 1) As you click on **Crosstabs**, a dialogue box with same name will open. This can be seen in figure 11.8. One question that may come to your mind is what is a crosstabs. Crosstabs can be used in order to create tables that show interaction between two variables that are categorical in nature.
- 2) As can be seen in figure 11.8, we have already entered our categorical variables, gender under **Rows** and Socio Economic Status under **Columns**.
- 3) You can also click on **Statistics** on the *Crosstabs* dialogue box. As you do so, the *Crosstabs: Statistics* dialogue box will open (refer to figure 11.9). Here you can click the statistics as per your requirement. Chi-square can also be clicked in case you want to compute the same. Though this will be discussed by us in the next unit. When you have finished selecting the required necessary,, do not forget to click on **Continue** button.
- 4) On the *Crosstabs* dialogue box you can also click on **Cell Display**, that will lead to opening of dialogue box labeled *Crosstabs: Cell display* (refer to figure 11.10). As per your requirement you can mark the required checkboxes. In our example we have clicked on **Observed** under **Counts**. Click **Continue** on the dialogue box *Crosstabs: Cell Display*.
- 5) Lastly, remember to click **OK** on *Crosstabs* dialogue box. And as you do so the results will be displayed in the **Output View** of SPSS (as can be seen in Box 11.3). The same can be tabulated and then interpreted as per requirement. As can be seen in the box 11.3, we have a contingency table that shows an interaction between gender and Socio Economic Status.

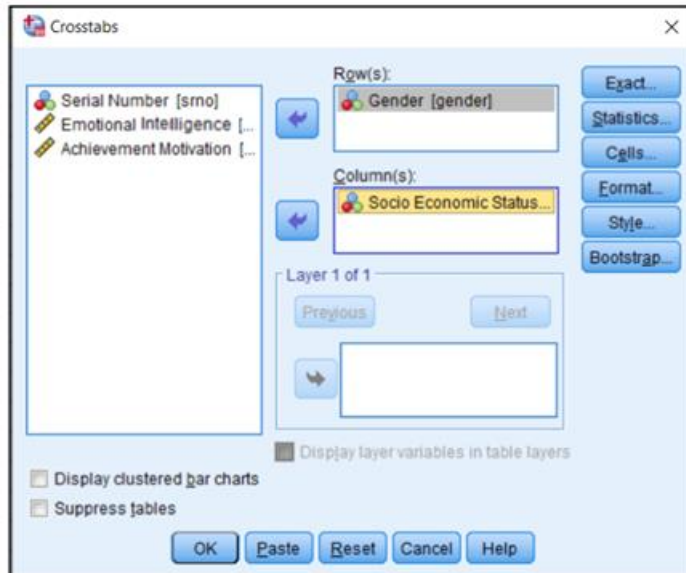


Fig. 11.8 : Crosstab

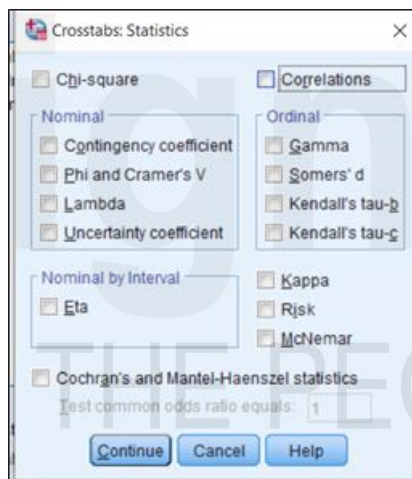


Fig. 11.9 : Crosstab: Statistics Dialogue box

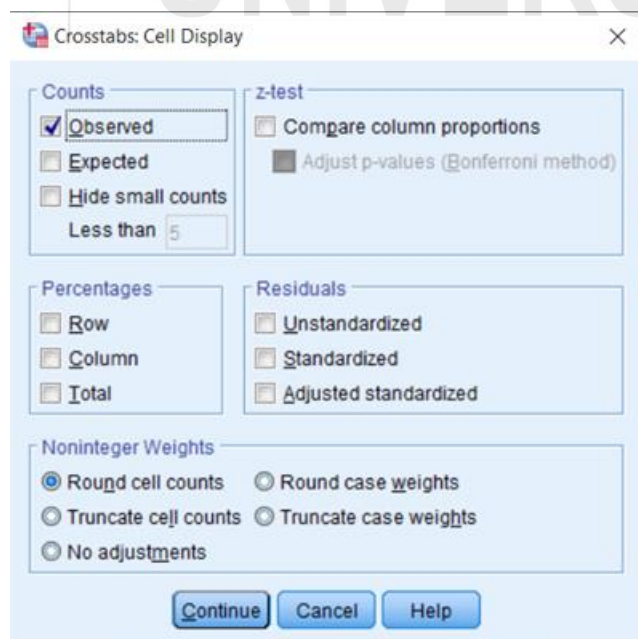


Figure 11.10: Crosstab: Cell Display Dialogue box

Box 11.3: Results obtained from Crosstabs					
Gender * Socio Economic Status Crosstabulation					
Count					
		Socio Economic Status			Total
		Low Socio Economic Status	Medium Socio Economic Status	High Socio Economic Status	
Gender	Male	2	3	5	10
	Female	4	4	2	10
Total		6	7	7	20

Check Your Progress III

1) What is the use of Crosstabs?

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11.5 GRAPHS IN SPSS

In BPCC104, we discussed about graphs. As you know graphs help us present the data in simple and concise manner and that is the reason why in your research paper or report you need to include graphs as and when necessary. Graphs can also be created with the help of SPSS and let us now discuss how that is to be done.

- 1) On SPSS main menu, you need to click on **Graphs** and then on **Chart Builder**. Thus, **Graph > Chart Builder**. (Refer to figure 11.11).
- 2) As you click on **Chart Builder**, the dialogue box **Chart Builder** will open (as can be seen in figure 11. 12). On this dialogue box, you can click on **Define Variable Properties** tab. And as you do so, the **Define Variable Properties** dialogue box will open as can be seen in figure 11.13. Here you can select your nominal or ordinal variable from the space given under **Variables** to the space given under **Variables to Scan** with the help of the arrow given between the two spaces. Then click on **Continue** button. Once the **Continue** button is clicked, the **Define Variable Properties dialogue box** with scanned variable list (as can be seen in figure 11.14) will open. In this enter the details as required and then click on **OK**.

- 3) Then again click on **Graphs** and then on **Chart Builder**, the dialogue box that will open is labeled **Chart Builder** and can be seen in figure 11.15. Let us try to understand this dialogue box better before we go on to creating charts. As can be seen in this dialogue box you have **Variables** on the left side under which all the variables that we have typed in SPSS spreadsheet appear. You also have **Chart preview**, where the chart will be displayed as you fill in the data. Below you have **Gallery, Basic elements, Groups/ Point ID and Tiles and Footnotes** that can be used as and when required.
- 4) The very first thing you will be required to do is drag the graph type (either bar or line graph etc.) from the **Gallery** in the **Chart preview**. As has been shown with the help of the arrow in figure 11.15. In the case of our example, we have taken the simple bar graph.
- 5) Axis and elements can be chosen by clicking on basic elements as can be seen in figure 11.16.
- 6) We then drag the variable gender in x axis in **Chart preview** and the variable emotional intelligence under **Axis label** on the right hand side as can be seen in figure 11.17. You can also go to chart appearance and change the colour of the graph. Chart appearance can be seen in figure 11.17.
- 7) Once all the information is filled in as per the requirement, we need to click **OK**.
- 8) The graph will then be displayed in **output view** and will look like figure 11.18. The same can then be included in your research report or paper.

Yet another example of bar graph is given in figure 11.19. This is a cluster graph and as can be seen in the figure, we have dragged gender to the upper left side of the **chart preview**, Socio Economic Status on the x axis and emotional intelligence (with mean, as can be seen on the right side in figure 11.16). The graph thus obtained is given in figure 11.19.

Thus, graphs and charts can be created as per requirement in order to enhance the presentation of our research report or paper.

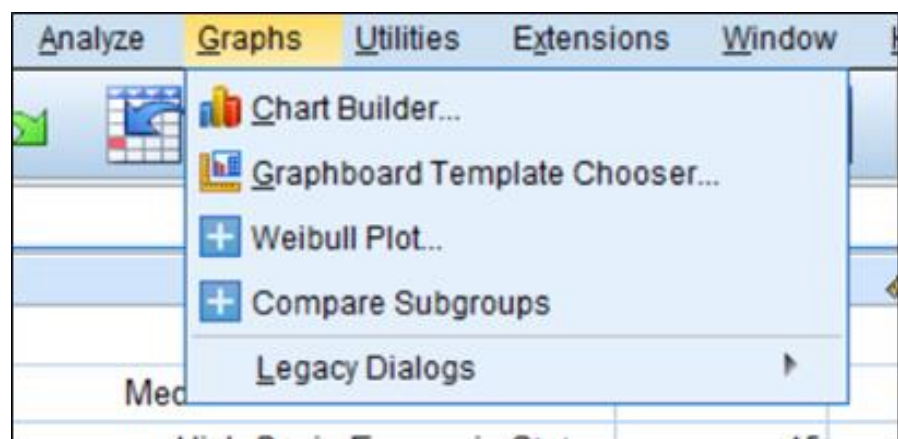


Fig. 11.11: Screenshot of Main Menu Graphs> Chart Builder

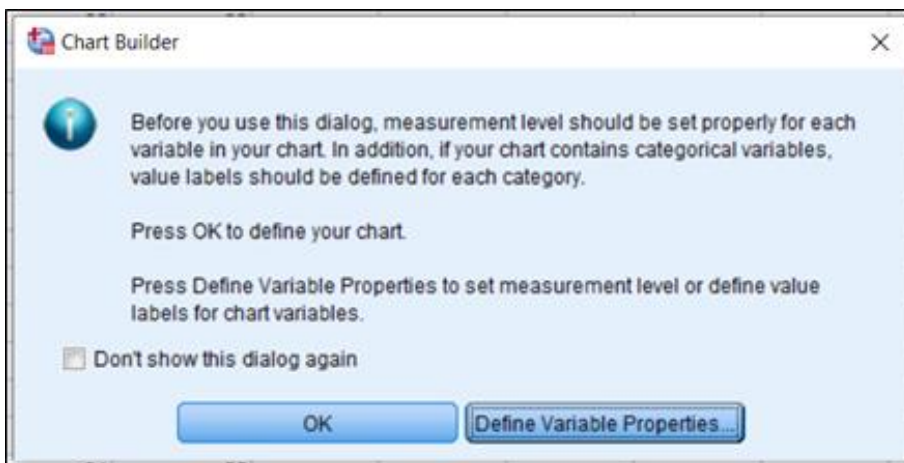


Fig. 11. 12: Chart Builder Dialogue Box

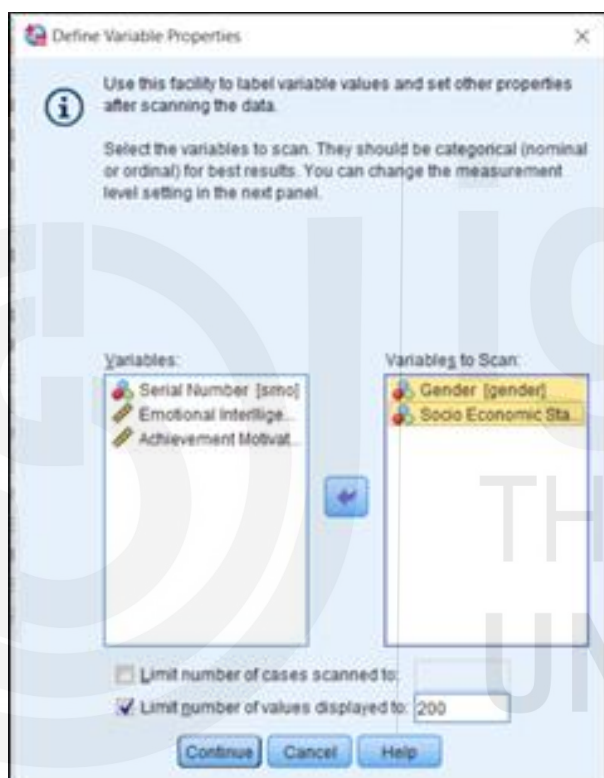


Fig. 11. 13: Define Variable Properties Dialogue Box

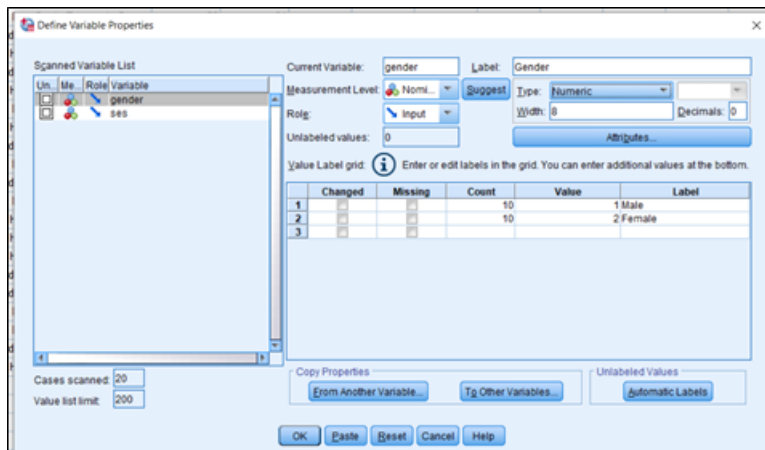


Fig. 11. 14: Define Variable Properties Dialogue Box with Scanned Variable List

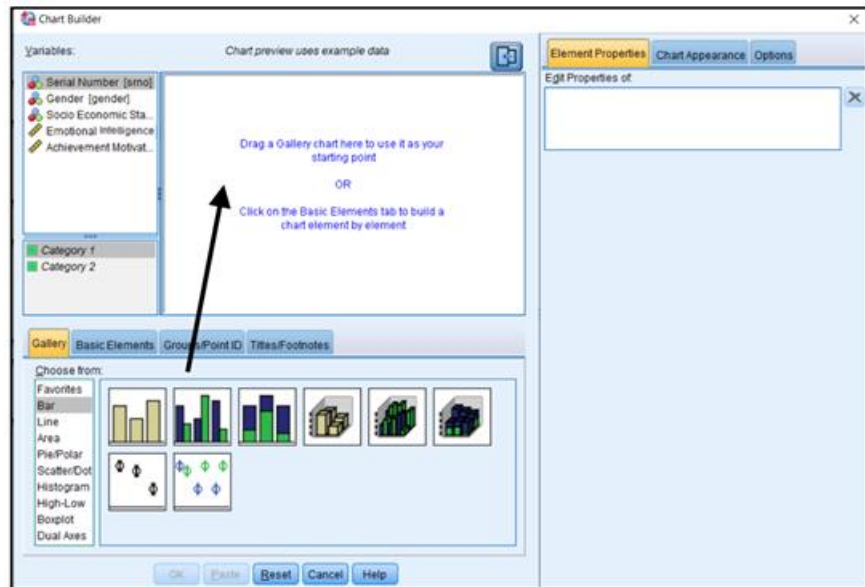


Fig. 11.15: Chart Builder

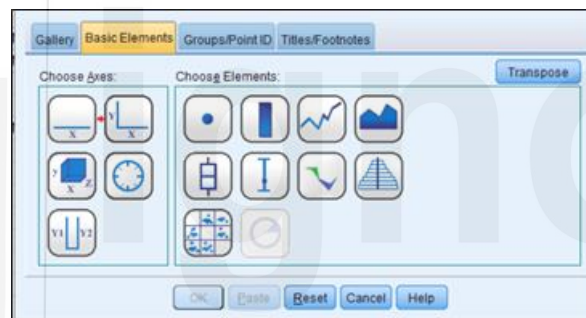


Fig. 11.16: Basic Elements

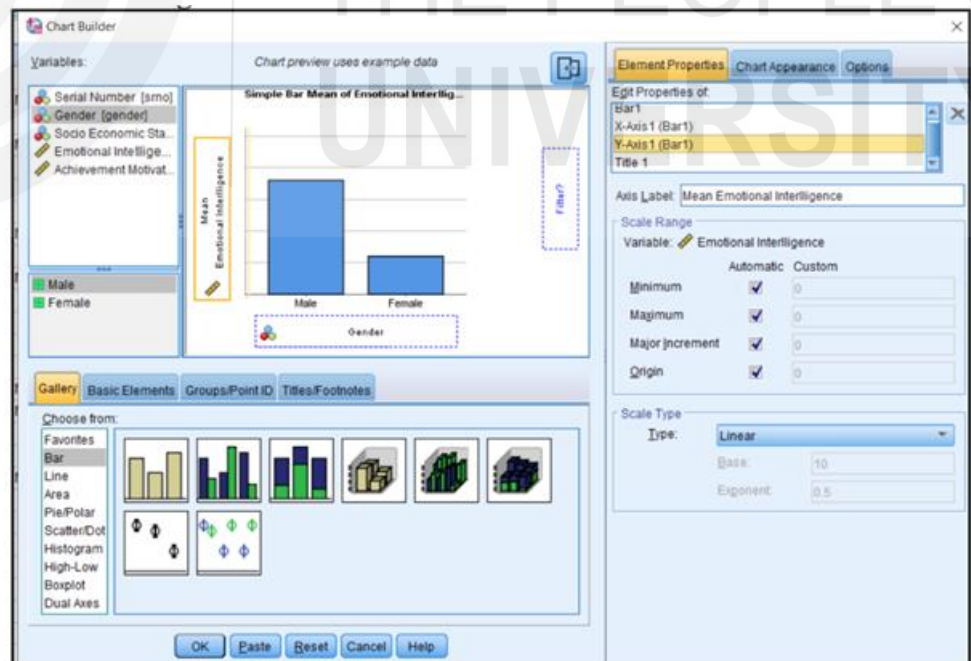


Fig. 11. 17: Chart Builderafter Data is entered.

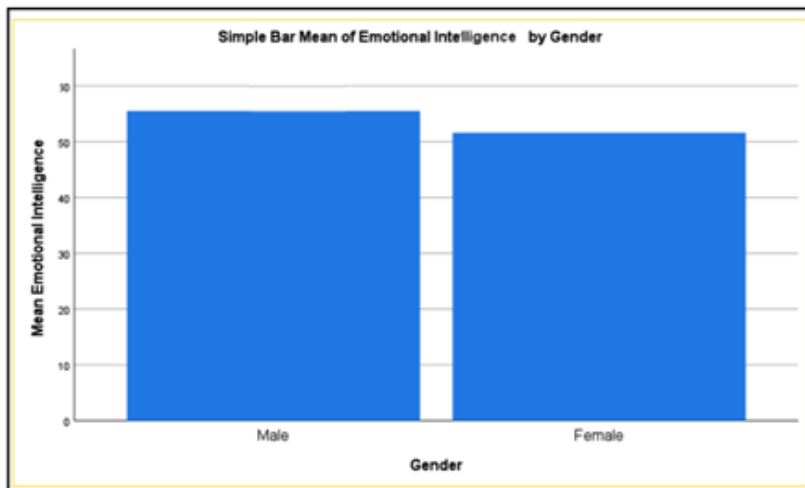


Fig. 11.18 : Bar Graph obtained in SPSS



Fig. 11.19: Cluster Bar Graph in SPSS

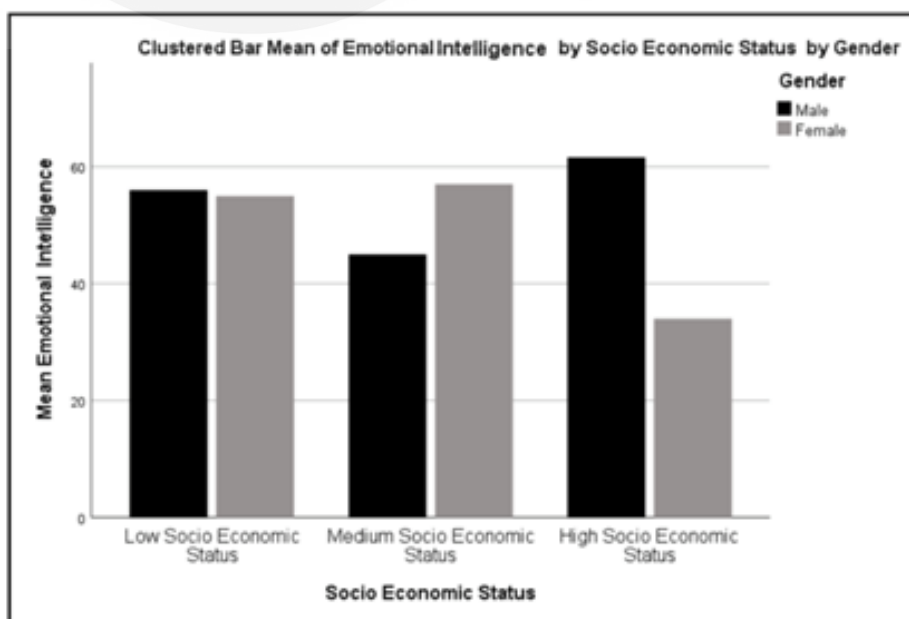


Fig. 11.20: Cluster Bar Graph obtained in SPSS

Check Your Progress IV

1) Look at the graph given in figure 11.20 and answer the following questions:

a) What do the black bars denote?

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b) What do the grey bars denote?

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c) Which sample sub group has the highest mean emotional intelligence?

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d) Which sample sub group has the lowest mean emotional intelligence?

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11.6 LET US SUM UP

To sum up, in the present unit, we discussed about computation of frequency, descriptive statistics and *Crosstabs* using SPSS. We also discussed about graphs in SPSS. This was done by us with the help of figures.

11.7 REFERENCES

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Field, A. (2018). *Discovering statistics using IBM SPSS statistics*. London: SAGE.

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Landau, Sabine and Everitt, Brian. S. (2004) *A Handbook of Statistical Analyses using SPSS*. London: Chapman and Hall.

Rasch, Dieter; Kubinger, K. D and Yanagida, Takuya. (2011). *Statistics in Psychology Using R and SPSS*. United Kingdoms: John Wiley & Sons Ltd.

McClean, P. (2018). *Spss*. US: Trittech Digital Media.

11.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress I

- 1) What is the first step in computation of frequencies in SPSS?

Go to the pulldown menu *Analyze* and the click on *Descriptive Statistics* and then on *Frequencies* (Analyze > Descriptive Statistics> Frequencies).

Check Your Progress II

- 1) In box 11. 2, what is the range and mean obtained for variable emotional intelligence?

Range: 54 Mean: 53, 55

Check Your Progress III

- 1) What is the use of Crosstabs?

Crosstabs can be used in order to create tabled that shown interaction between two variables that are categorical in nature.

Check Your Progress IV

- 1) Look at the graph given in figure 11.20 and answer the following questions:

- a) What do the black bars denote?

Male

- a) What do the grey bars denote?

Female

- b) Which sample sub group has the highest mean emotional intelligence?

High Socio Economic Status Males

- c) Which sample sub group has the lowest mean emotional intelligence?

High Socio Economic Status Females

11.8 UNIT END QUESTIONS

- 1) Describe how to compute frequency using SPSS.
- 2) Discuss the procedure involved in descriptive statistics.
- 3) Explain what is crosstabs and discuss the procedure to create crosstabs using SPSS.
- 4) Explain the procedure to draw graphs in SPSS.

