

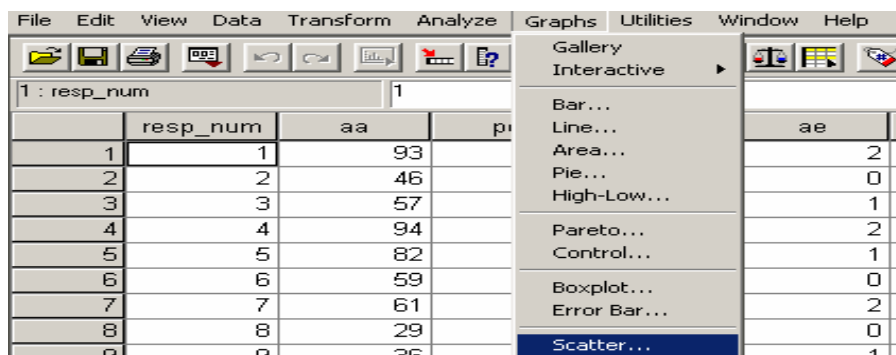
## Lecture 8: Correlation Analysis and Regression Analysis by SPSS

### Tasks:

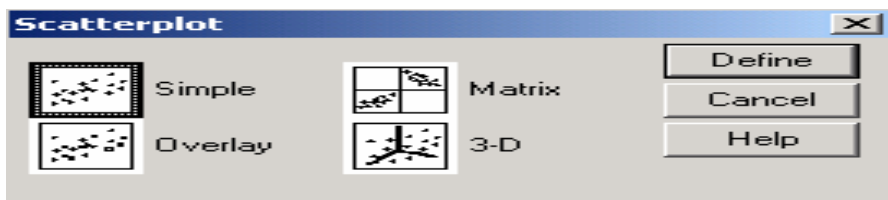
1. To what extent are academic ability and parents' education related to one another? Use **scatterplot** of the data to assess any relationship.
2. Use Pearson Correlation Coefficient to see the relationship between academic ability and parents' education in a linear fashion.
3. Modify your output displayed in pivot table.
4. How well can we predict the academic ability (aa) of the students if we know something about the parents education (pe)? (Use simple regression).
5. Use multiple regression and predict the academic ability of the students. Assume that you have information on parents education (pe), student motivation (sm), advisor evaluation (ae), religious (r), gender (g) and community (c).

### Tips for task 1

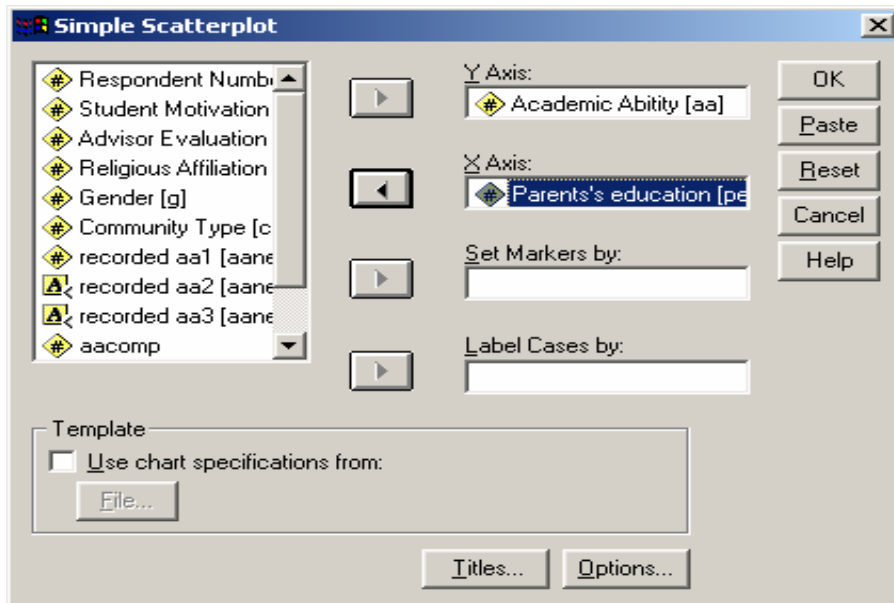
From the **Graphs** pull-down menu, select **Scatter** (see fig1). Click on **Simple** and then the **Define** button (see fig 2). Choose variable "**aa**" for the y-axis and choose variable "**pe**" for the x-axis (see fig 3). Next, click the **Titles** button, type "Scatterplot" for **Title Line 1**, type "academic ability and parents' education" for **Title Line 2**, and click the **Continue** button (see fig 4). Finally, click the **OK** button and take a look the chart that is produced. Can you see any relationship between these two variables? (See fig 5).



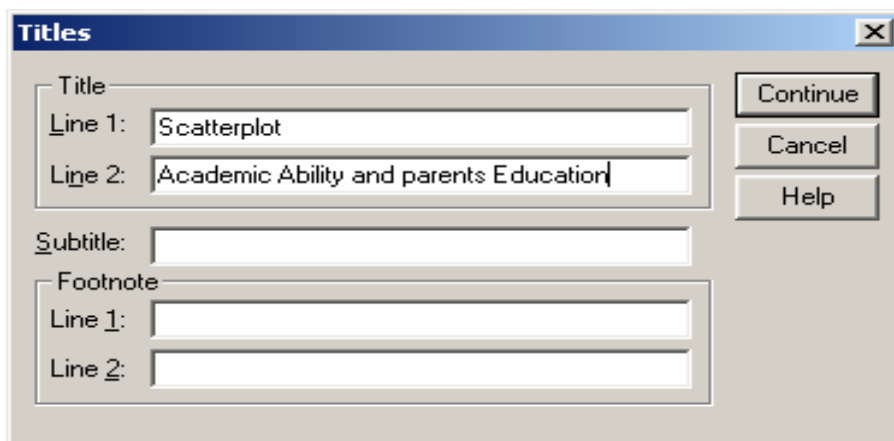
**FIG 1**



**FIG 2**



**FIG 3**



**FIG 4**

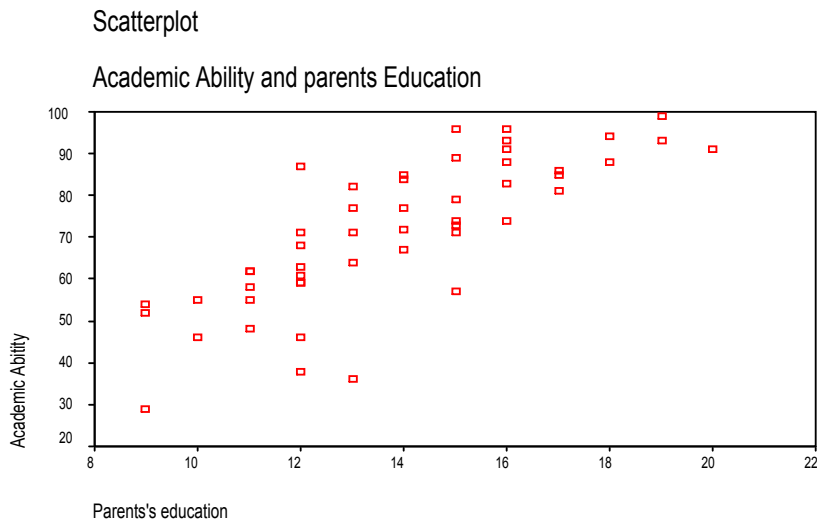


FIG 5

As you can see from the scatterdot, there is a linear relationship between academic ability and parents education.

**Tips for task 2**

*The correlation coefficient is a statistic commonly used to assess the strength of a relationship between two variables that are linearly related each other. To obtain the correlation coefficient, from the **Analyze** pull-down menu, select **Correlate** then choose **Bivariate** (see fig 6). When you see the relevant dialog box, select the variables “aa” and “pe”, and choose the **Pearson** correlation coefficient, then, click both the radio buttons of **two-tailed** test of significance, and **Flag significant correlations** (see fig 7). Finally click **OK** to run the Correlation procedure (see fig 8).*

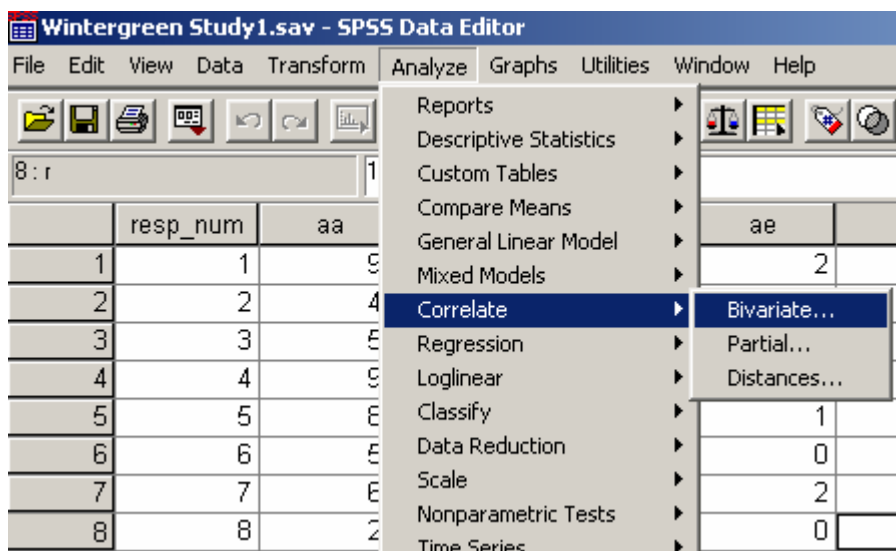
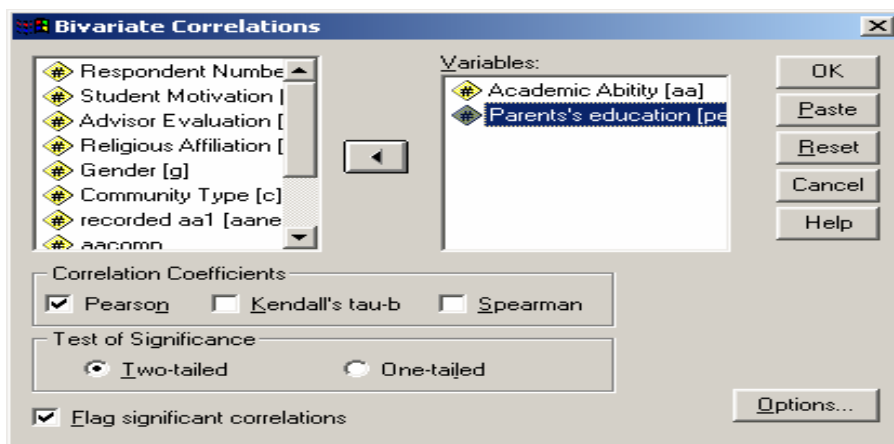
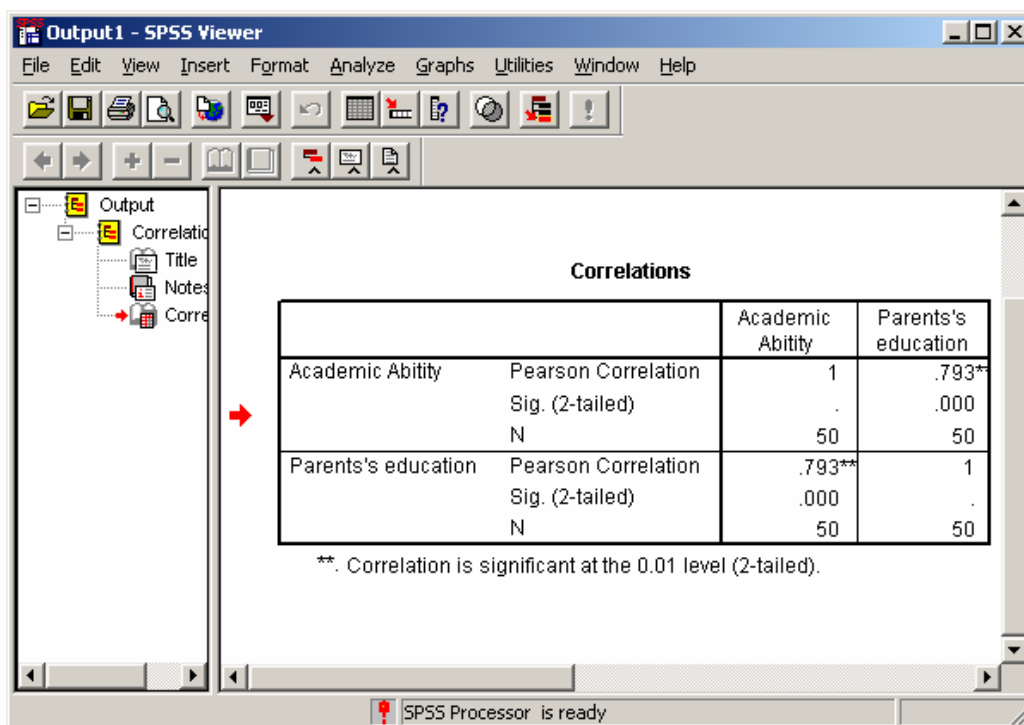


FIG 6



**FIG 7**



**FIG 8**

To interpret the correlation coefficient, you examine the coefficient and its associated significance value (p). The output confirms the results of the scatterplot in that a significant positive relationship exists between aa and pe. ( $r=0.793$ ,  $p=0.000$ ). Therefore, parents' education is associated with the academic ability.

### **Tips for Task 3**

Output displayed in pivot tables can be modified in a number of ways. Clicking the right mouse button to open the SPSS Pivot Table Object. This will reveal the Pivot Table, formatting toolbar and pivot trays and allow editing of tables to begin.

### **Tips for Task 4**

To conduct the analysis (i.e. simple regression), from the **Analyze** pull-down menu, select **Regression**, then choose **Linear**. When the dialog box appears, select “aa” as the dependent variable and “pe” as the independent variable. Choose **statistics** button and click on the boxes of **estimates**, **model fit**, and **descriptives** and then click on continue to return to the main regression dialog box. Finally, click on the **OK** button to run the analysis

### **Tips for Task 5**

*This is a multiple regression analysis. To conduct this analysis, from the **Analyze** pull-down menu, select **Regression**, then choose **Linear**. When the dialog box appears, select “aa” as the dependent variable and the rests (sm, ae, pe,g, r and c) as independent variables. Now, select **statistics** button and click on the boxes of **estimates**, **model fit**, and **descriptives** and then click on continue to return to the main regression dialog box. Finally, click on the **OK** button to run the analysis.*