



# UJI KORELASI

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2018

# Correlation

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Correlation is primarily concerned with investigating whether a relationship exists and with determining its magnitude and direction. When two variables vary together, such as loneliness and depression, they are said to be correlated.

This chapter presents two correlation coefficients: the *Pearson product moment correlation coefficient* ( $r$ ), employed with **interval- or ratio-scaled** variables, and the *Spearman rank order correlation coefficient* ( $\rho$ ), employed with **ordered or ranked data**.

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It is important to note that, irrespective of which correlational technique the researcher uses, they have the following characteristics in common:

1. Two sets of measurements are obtained on the same individuals or on pairs of individuals who are matched on some basis.
2. The values of the correlation coefficients vary between **+1.00** and **−1.00**. Both of these extremes represent perfect relationships between the variables, and **0.00** represents the absence of a relationship.

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3. A *positive relationship* means that individuals obtaining high scores on one variable tend to obtain high scores on a second variable. The converse is also true, that is, individuals scoring low on one variable tend to score low on a second variable.

4. A *negative relationship* means that individuals scoring low on one variable tend to score high on a second variable. Conversely, individuals scoring high on one variable tend to score low on a second variable.

# Requirements

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- For each subject in the study, there must be *related pairs of scores*. That is, if a subject has a score on variable  $X$ , then the same subject must also receive a score on variable  $Y$ .
- The variables should be measured at least at the *ordinal level*

# A s s u m p t i o n s

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- **Linearity**—The relationship between the two variables must be *linear*, that is, the relationship can be most accurately represented by a straight line.
- **Homoscedasticity**—The variability of scores along the Y variable should remain constant at all values of the X variable

## Example 1: Pearson Product Moment Correlation Coefficient

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Assume that a researcher wishes to ascertain whether there is a relationship between grade point average (GPA) and the scores on a reading-comprehension (READ) test of 15 first-year students. The researcher recorded the pair of scores below, together with their rankings.



Student	Read	Read_Rank	GPA	GPA_Rank
s1	38	13	2.1	13
s2	54	3	2.9	6
s3	43	10	3.0	5
s4	45	8	2.3	12
s5	50	4	2.6	7.5
s6	61	1	3.7	1
s7	57	2	3.2	4
s8	25	15	1.3	15
s9	36	14	1.8	14
s10	39	11.5	2.5	9.5
s11	48	5.5	3.4	2
s12	46	7	2.6	7.5
s13	44	9	2.4	11
s14	39	11.5	2.5	9.5
s15	48	5.5	3.3	3




# Data Entry Format

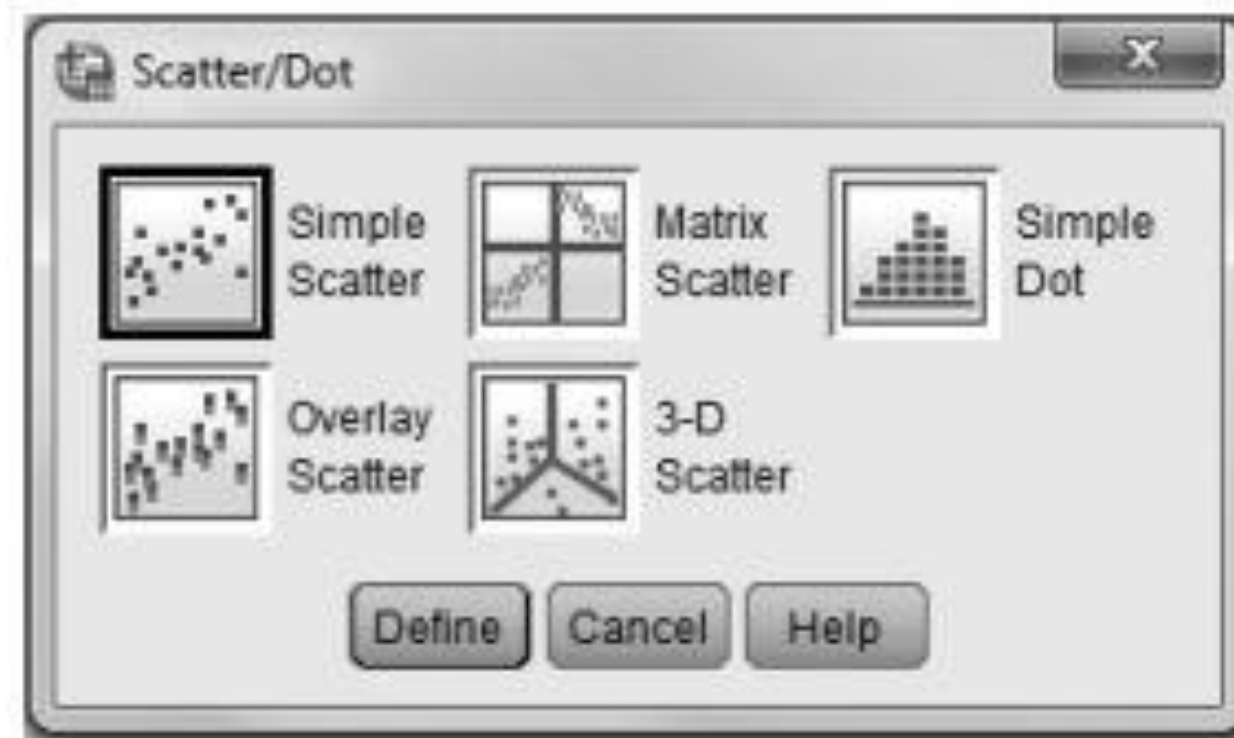
Variables	Column(s)	Code
READ	1	Reading score
READ_RANK	2	Ranking
GPA	3	Grade point average
GPA_RANK	4	Ranking

READ\_RANK 1 Ranking

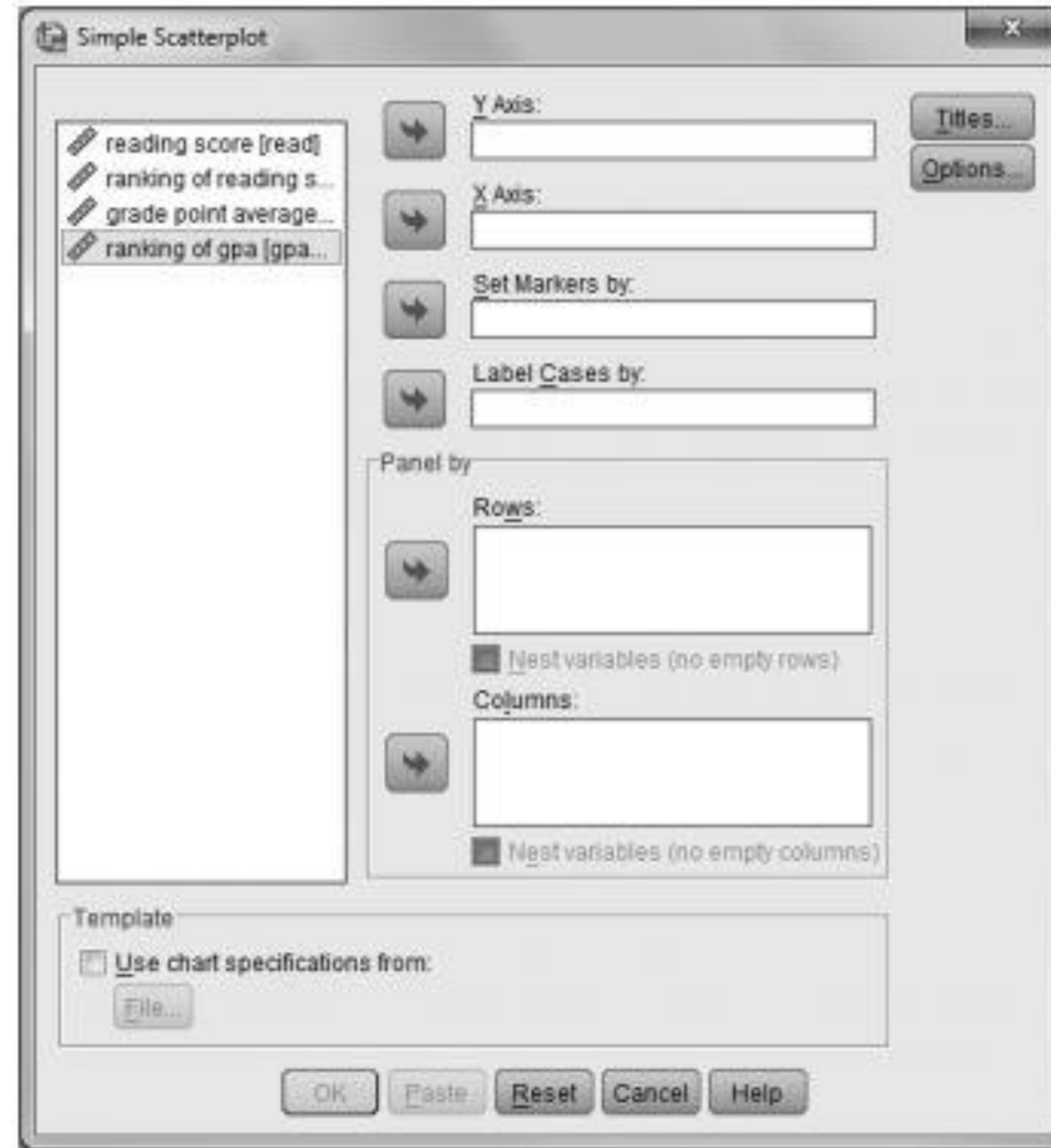
# Testing Assumptions

**Linearity** and **Homoscedasticity** Scatterplots will be used to test the assumptions of linearity and homoscedasticity.

1. From the menu bar, click **Graphs**, then **Legacy Dialogs**, and then **Scatter/Dot...**. The following **Scatter/Dot** window will open. Click (highlight) the  icon.



2. Click **Define** to open the **Simple Scatterplot** window below.

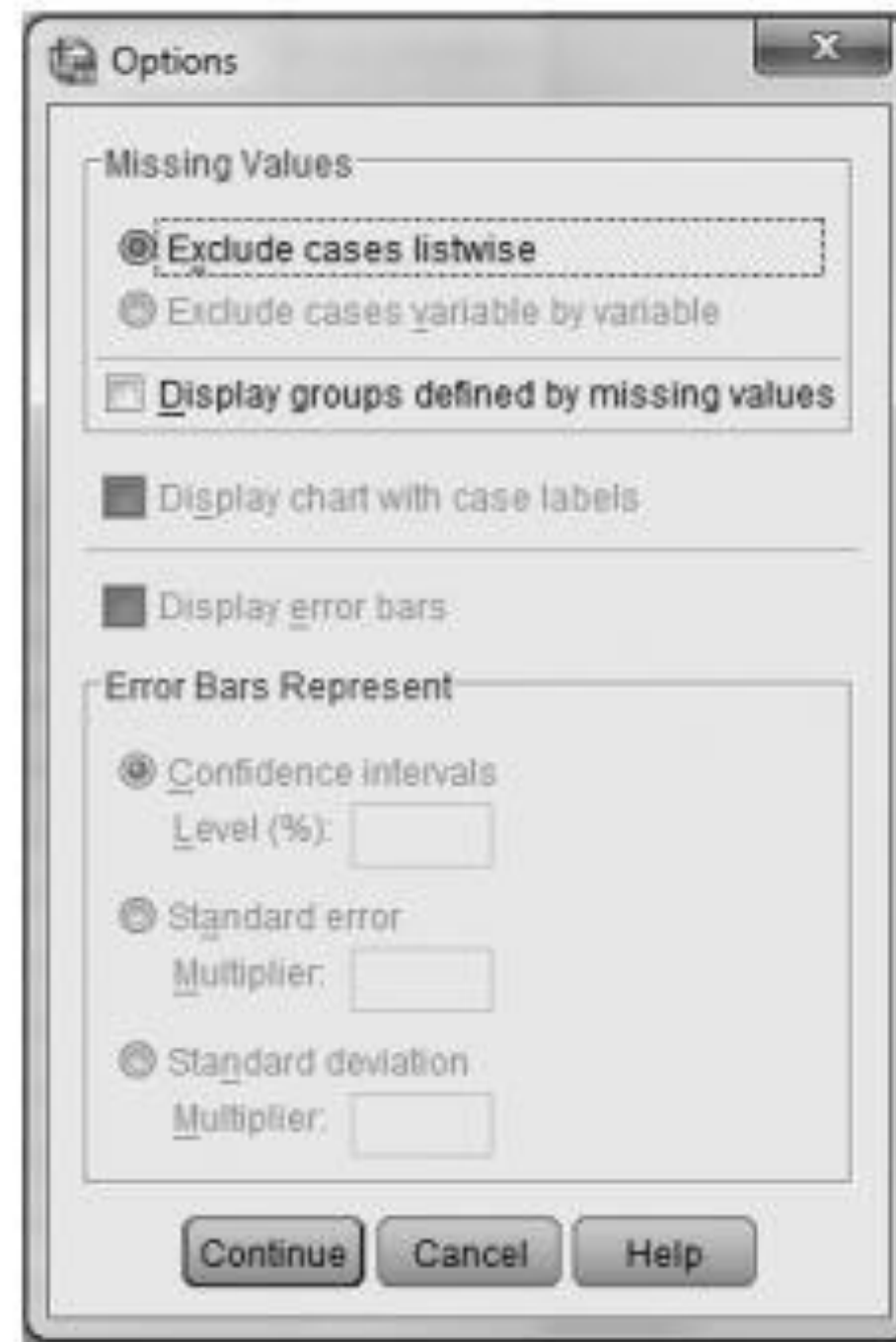


3. Transfer the **READ** variable to the **Y Axis:** field by clicking (highlight) the variable and then clicking ➡. Transfer the **GPA** variable to the **X Axis:** field by clicking (highlight) the variable and then clicking ➡.



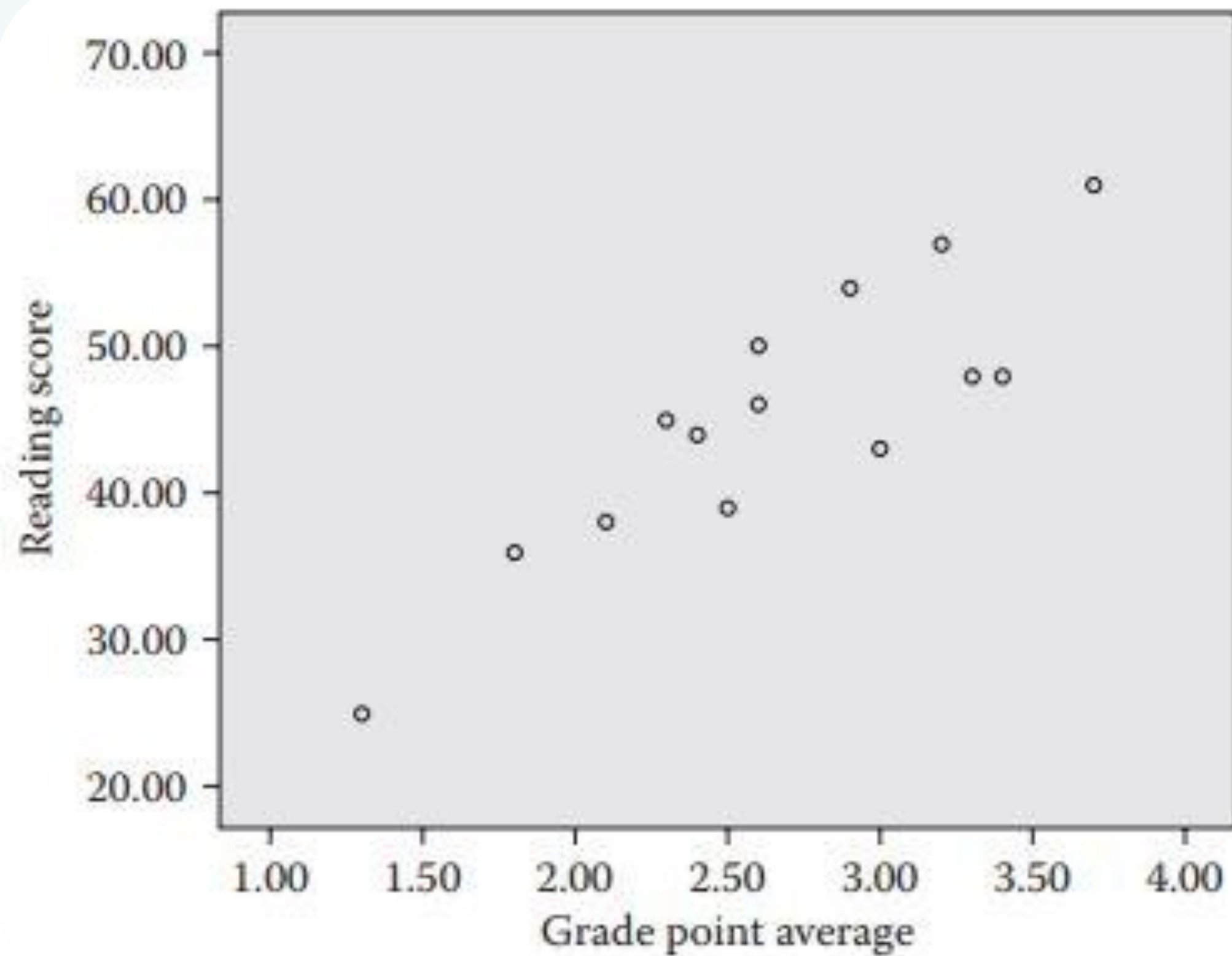


4. Click **Options...** to open the **Options** window below. Under **Missing Values**, ensure that the **Exclude cases listwise** field is checked. By default, for scatterplot, SPSS employs the **listwise** method for handling missing data. (For a discussion of the differences in the pairwise and the listwise methods of handling missing data, please see Section 10.3.6.)



5. Click **Continue** to return to the **Simple Scatterplot** window.







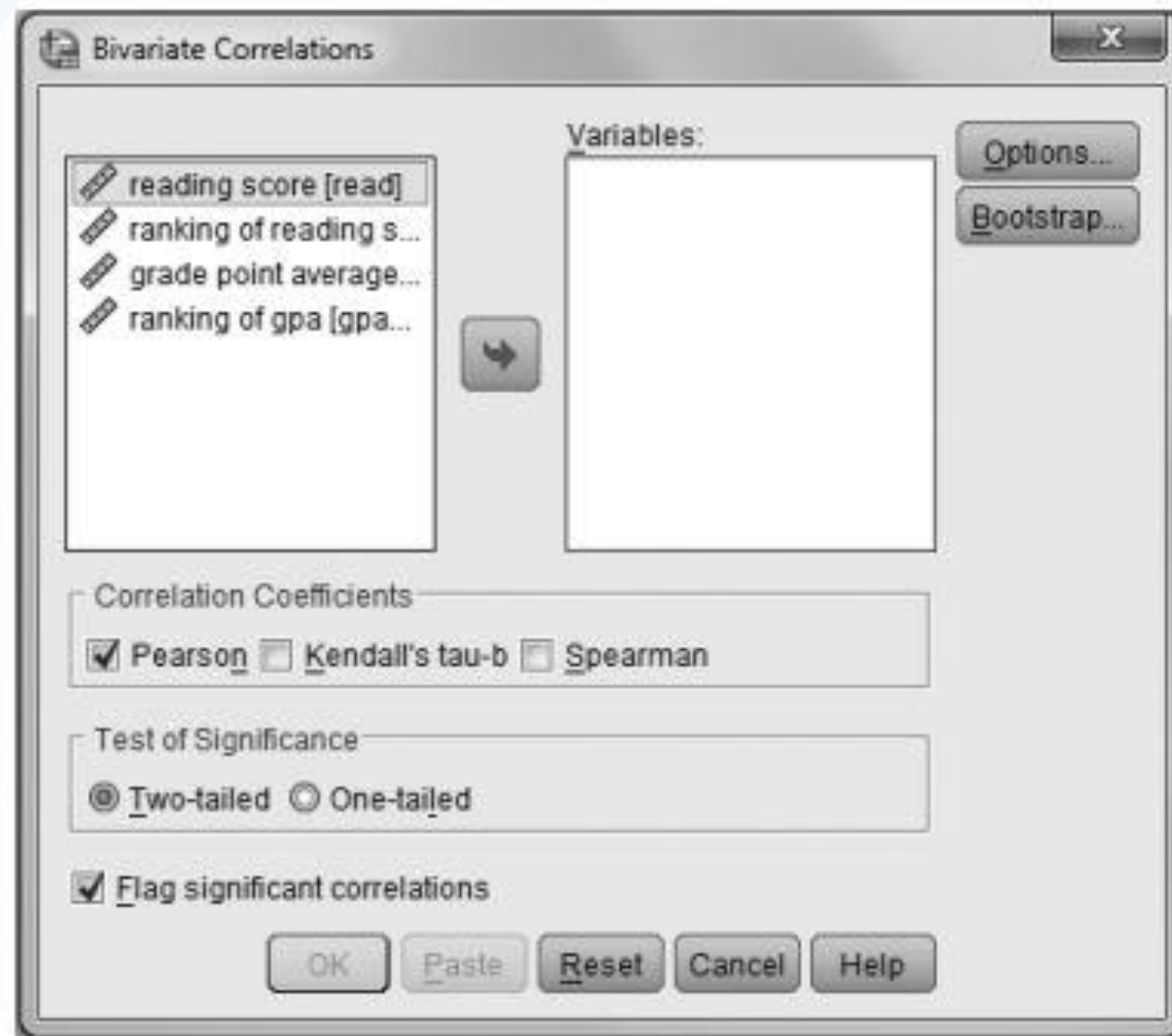
# Interpretation

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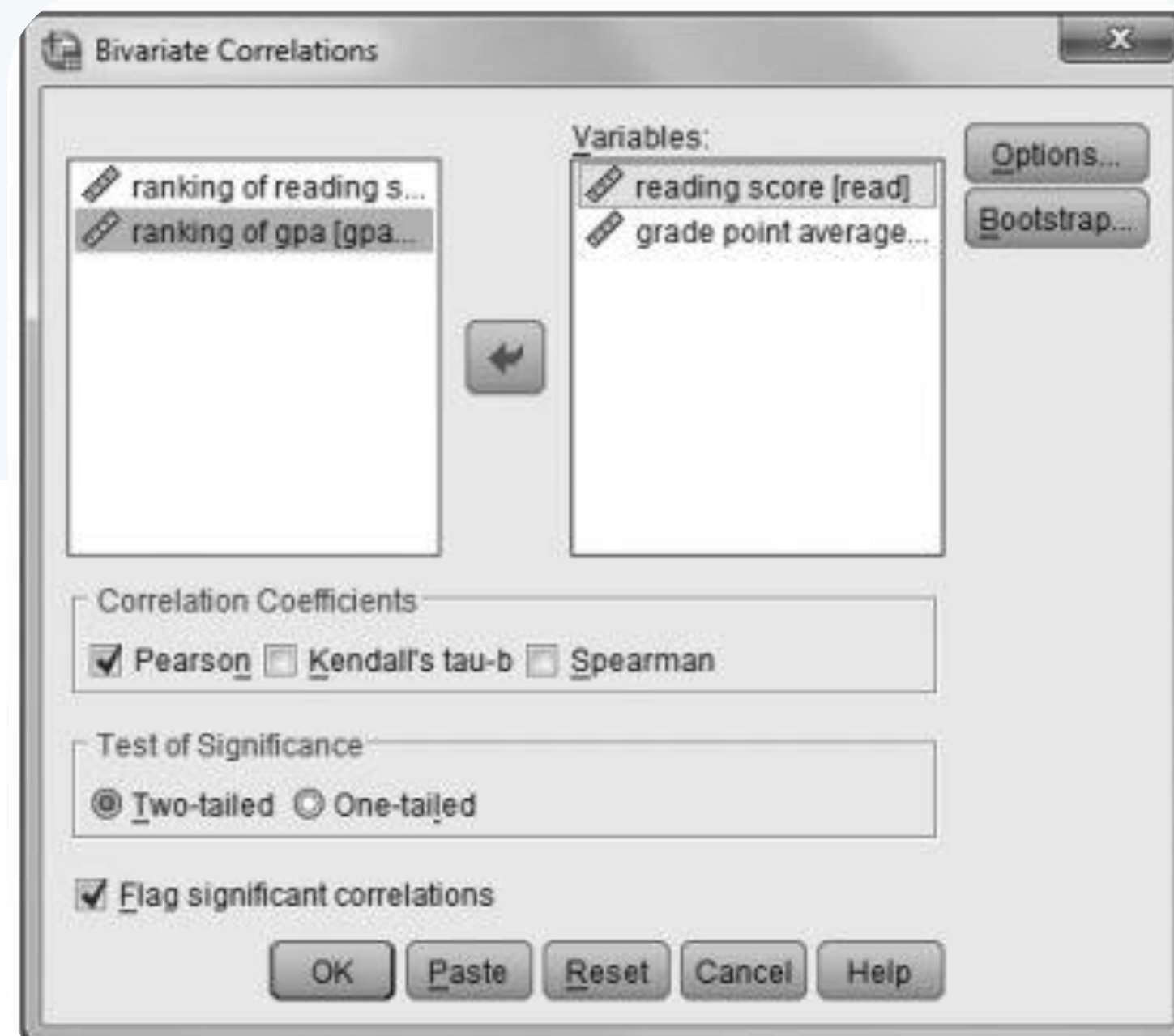
As can be seen from Figure, there is a linear relationship between the variables of reading score and grade point average, such that as reading score increases, so does grade point average. The figure also shows that the homoscedasticity assumption is met, because the variability of the READ score remains relatively constant from one GPA score to the next. Heteroscedasticity is usually shown by a cluster of points that is wider as the values for the Y variable (READ) get larger.

# Windows Method: Pearson Product Moment Correlation

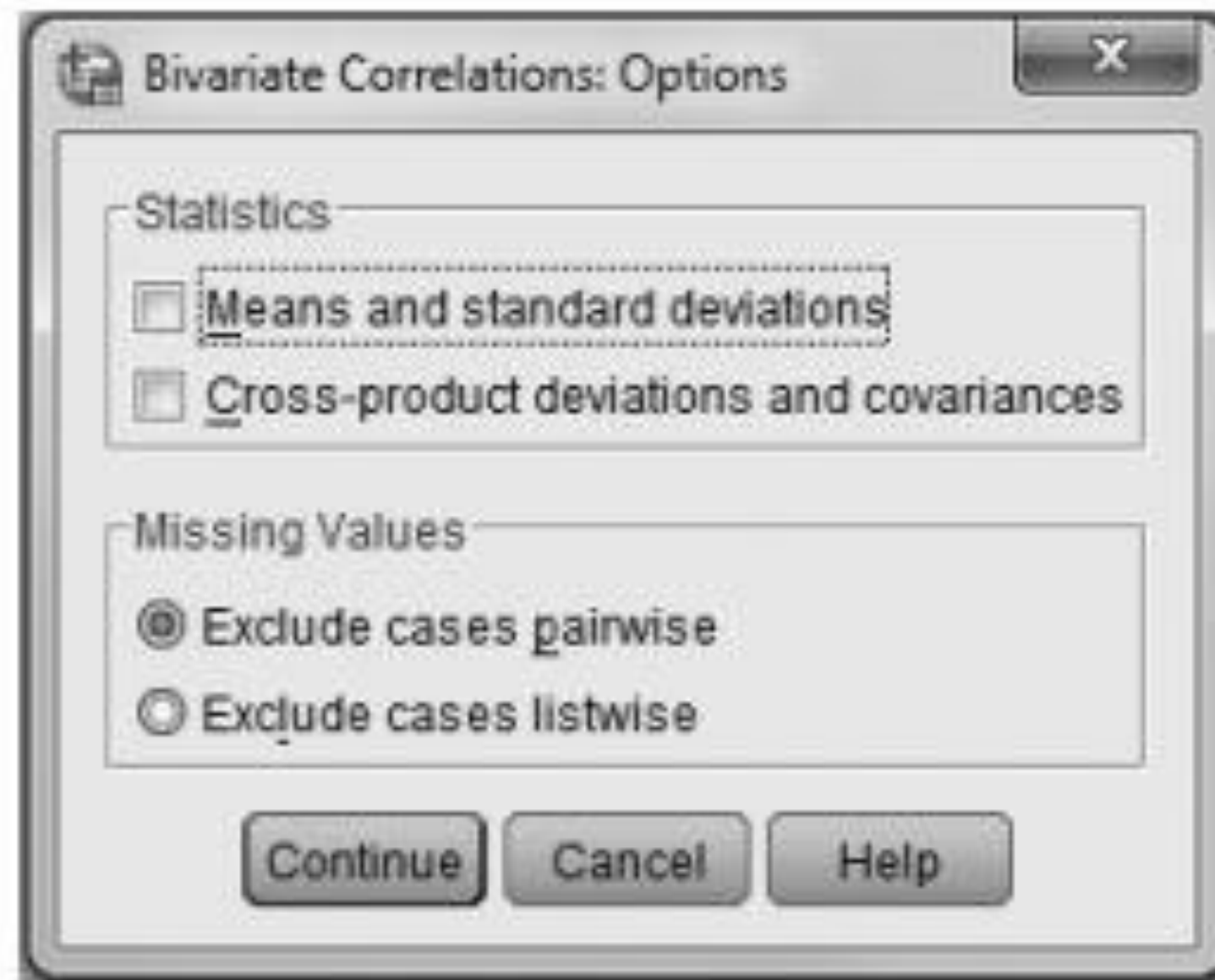
From the menu bar, click **Analyze**, then **Correlate**, and then **Bivariate....**The following **Bivariate Correlations** window will open.



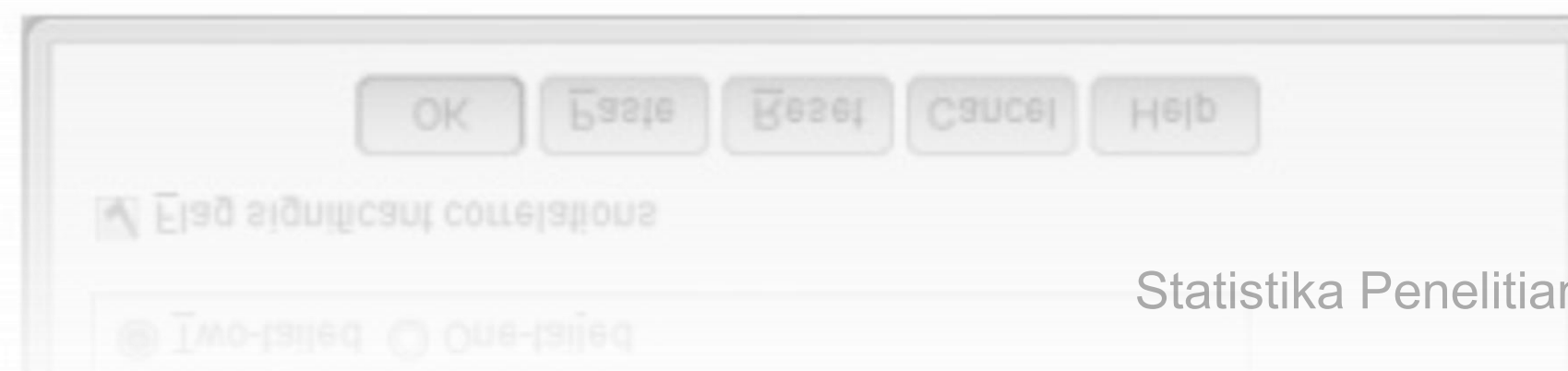
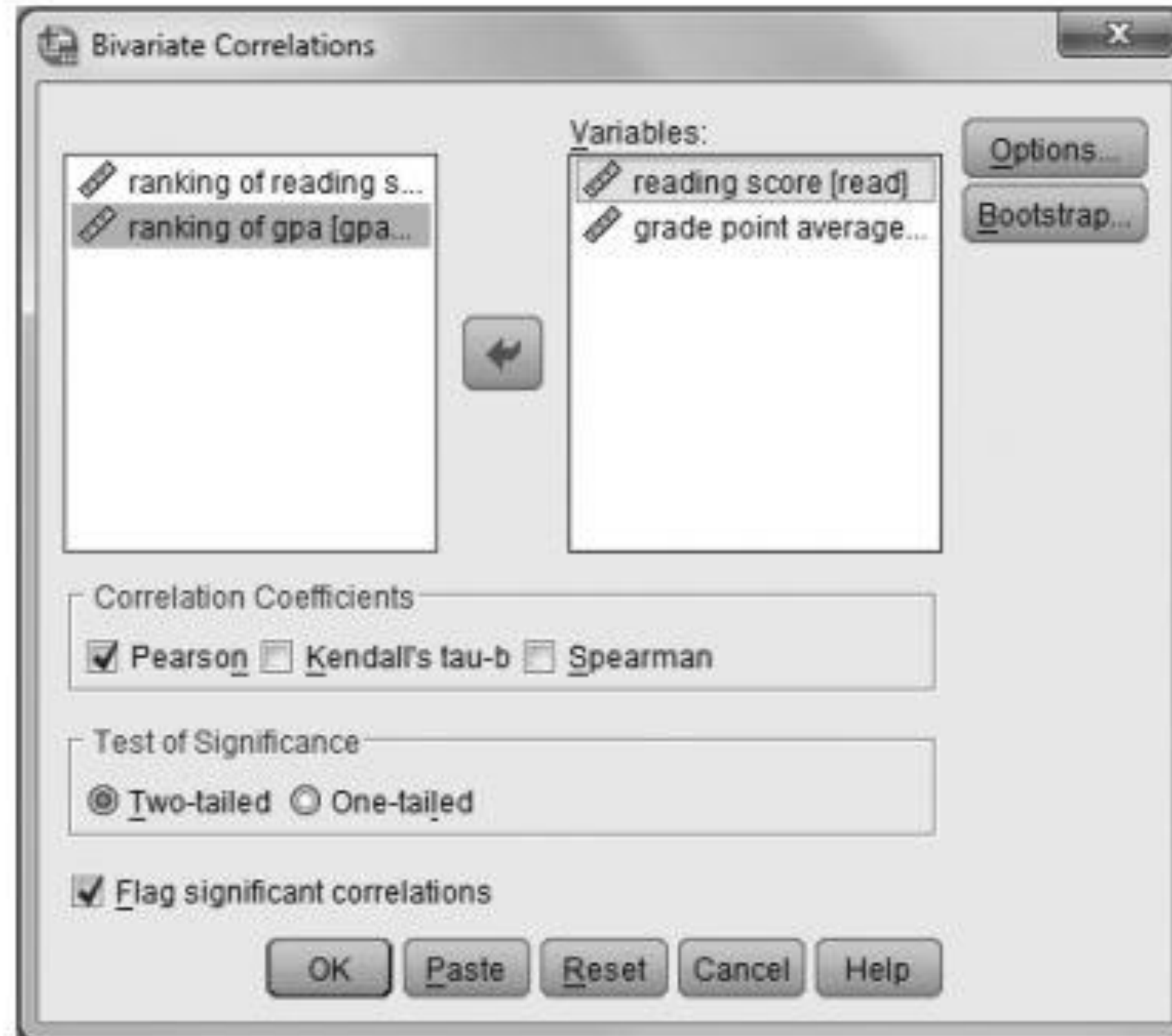
Transfer the **READ** and **GPA** variables to the **Variables:** field by clicking (highlight) them and then clicking . By default, SPSS will employ the **Pearson correlation analysis**, and a **two-tailed test of significance** (both fields are checked)



Click to open the **Bivariate Correlation: Options** window



Click **Continue** to return to the **Bivariate Correlations** window.





# SPSS Output

## Pearson Product Moment Correlation

### Correlations

		Reading Score	Grade Point Average
reading score	Pearson Correlation	1	.867**
	Sig. (2-tailed)		.000
	N	15	15
grade point average	Pearson Correlation	.867**	1
	Sig. (2-tailed)	.000	
	N	15	15

\*\* Correlation is significant at the 0.01 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

# Results and Interpretation

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The correlation between reading scores and grade point average is positive and statistically significant ( $r = 0.867$ ,  $p < .001$ ). This means that as the students' reading scores increase, so do their grade point averages. Please note that this interpretation in no way implies *causality*—that increases in reading scores caused increases in GPA scores. The significant relationship merely indicates that the two variables *covary*




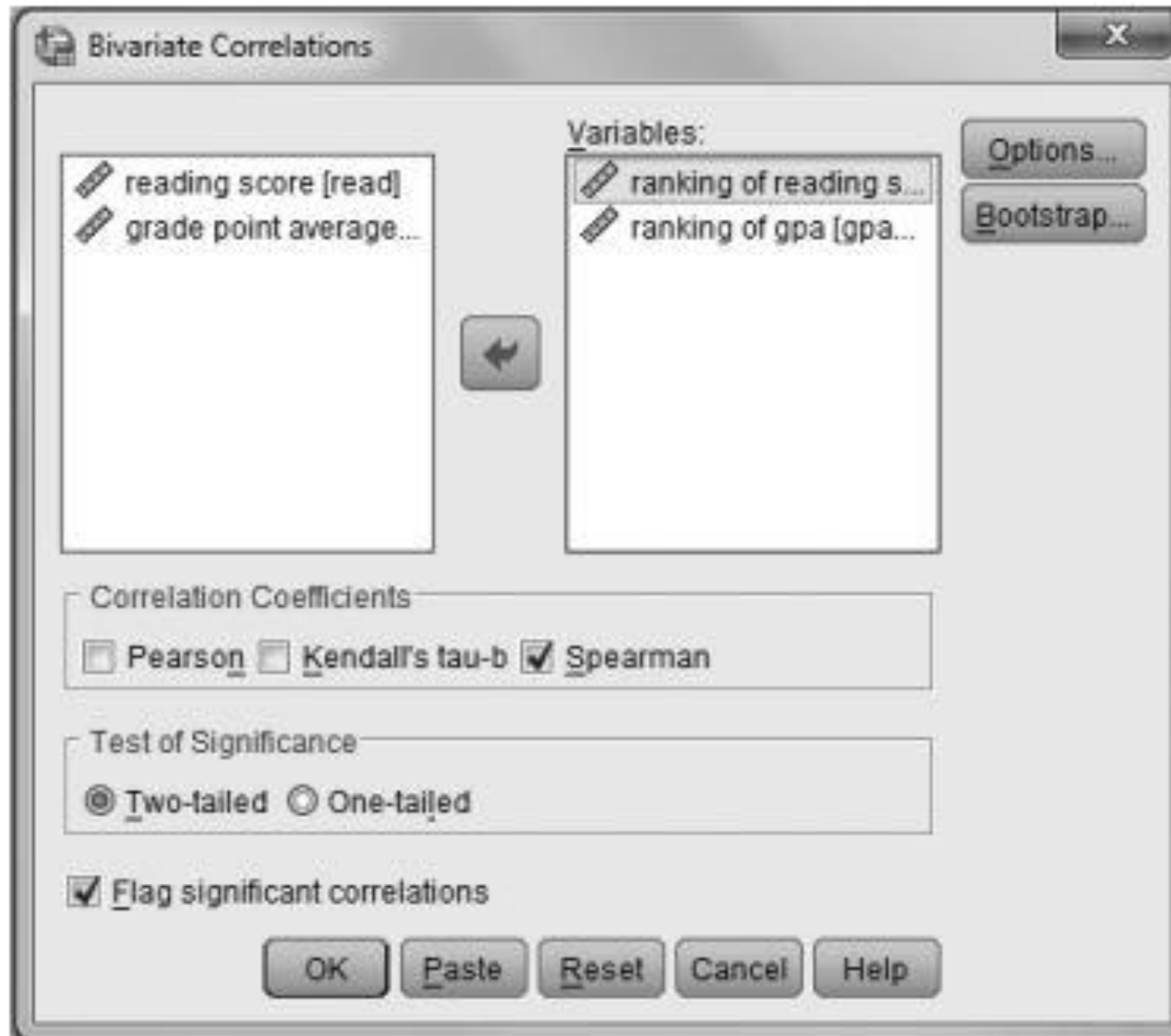
# Example 2: Spearman Rank Order Correlation Coefficient

For this example, the same data set (**CORR.SAV**) will be used. However, the rank order of the two variables (READ\_RANK, GPA\_RANK) will be used instead of their actual values as recorded.

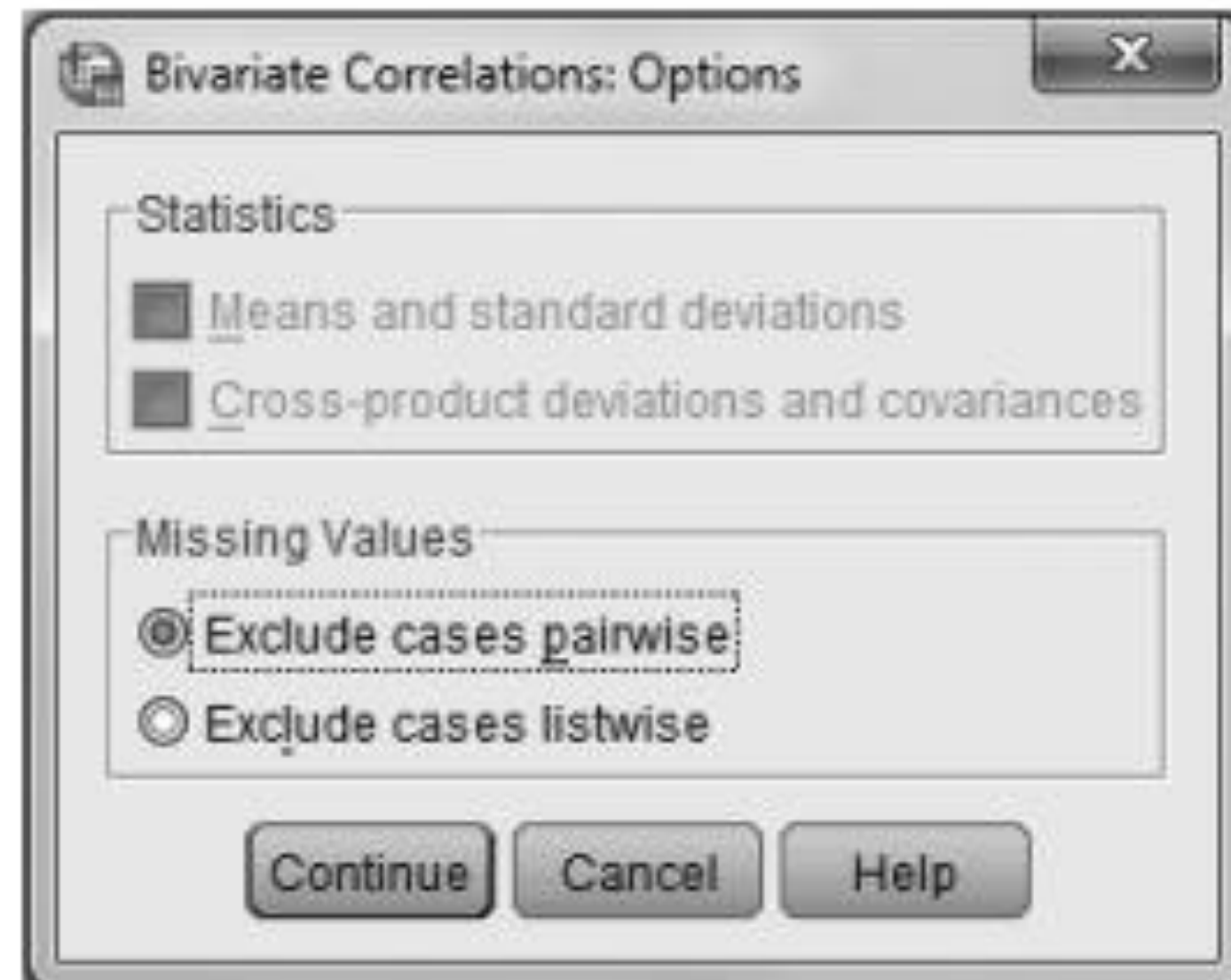
from the menu bar, click **Analyze**, then **Correlate**, and then **Bivariate...**  
The following **Bivariate Correlations** window will open.



transfer the **READ\_RANK** and **GPA\_RANK** variables to the **Variables:** field by clicking (highlight) them and then clicking . By default, SPSS will employ the **Pearson correlation analysis** (this field is checked). Uncheck the **Pearson** field and check the **Spearman** field.

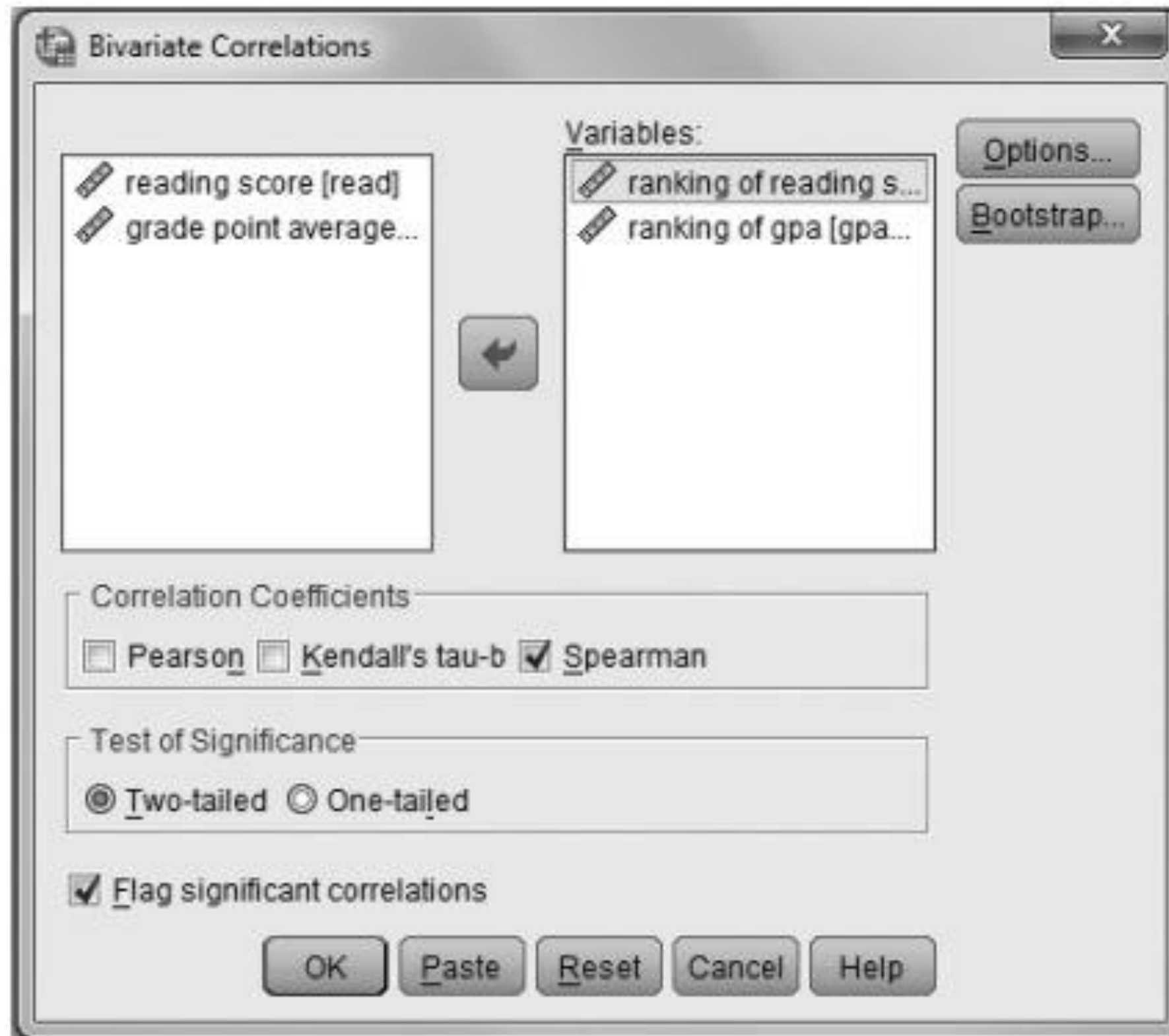


Click **Options...** to open the **Bivariate Correlation: Options** window. Ensure that the **Exclude cases pairwise** field is checked.





Click **Continue** to return to the **Bivariate Correlations** window.



# SPSS Output

## Spearman Rank Order Correlation

Correlations			Ranking of Reading Scores	Ranking of gpa
Spearman's rho	ranking of reading scores	Correlation	1.000	.826**
		Coefficient	.	.000
		Sig. (2-tailed) N	15	15
	ranking of gpa	Correlation	.826**	1.000
		Coefficient	.000	.
		Sig. (2-tailed) N	15	15

\*\* Correlation is significant at the 0.01 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

# Results and Interpretation

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The obtained Spearman rank-order coefficient ( $\rho = 0.826$ ,  $p < .001$ ) is highly similar in magnitude and direction to that in the Pearson correlation table (Table). Thus, similar to the Pearson coefficient, the Spearman coefficient indicates that as the students' ranked reading scores increase, so do their ranked grade point average scores.






# REFLEKSI

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1. Informasi penting hari ini
2. Manfaat penting dari informasi penting hari ini
3. Tindak lanjut yang dapat saudara lakukan

The background features teal-colored geometric shapes in the corners, resembling folded paper or abstract triangles. The main text is centered in a clean, sans-serif font.

# THANK YOU!

ANY QUESTIONS?