Pearson's Correlation -- Linear relationship between two quantitative variables

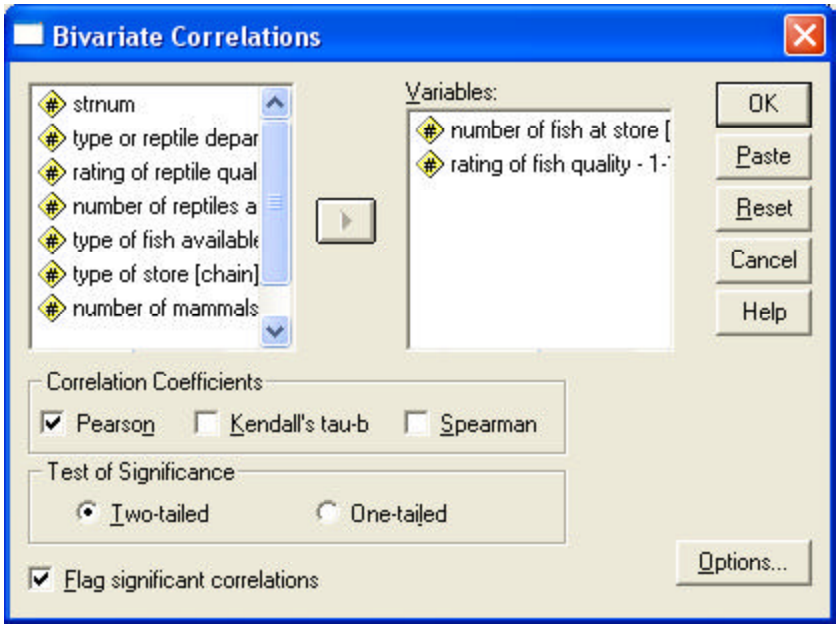
Application: To test for a linear relationship between two quantitative variables.

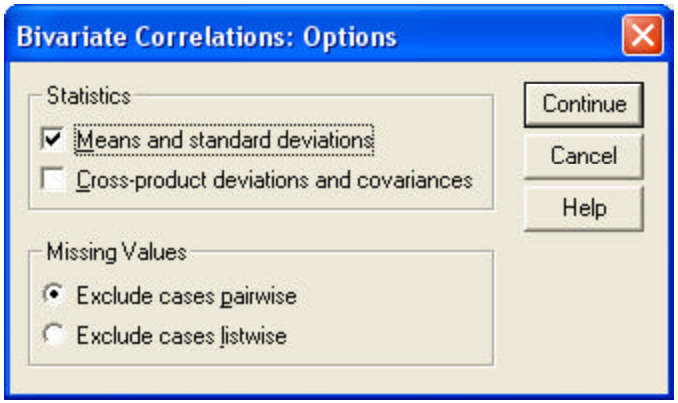
Research Hypothesis: Knowing that store owners are often over-worked, the researcher hypothesized that stores with fewer fish would have healthier fish (thus predicting a negative or inverse relationship between these variables in this population).

H0: There is no linear relationship between the number of fish displayed in pet stores and the quality rating of the fish.

Analyze ➔ Correlate ➔ Bivariate

- highlight each of the desired variables and click the arrow button
- be sure "Pearson" and "Two-tailed" buttons are checked
- "Options" — check that you want "Means and standard deviations"





Descriptive Statistics

	Mean	Std. Deviation	N
'number of fish at store'	23.92	9.61	12
'rating of fish quality - 1-10 scale'	6.67	2.15	12

Correlations

		'number of fish at store'	'rating of fish quality - 1-10 scale'
'number of fish at store'	Pearson Correlation	1.000	-.857**
	Sig. (2-tailed)	.	.000
	N	12	12
'rating of fish quality - 1-10 scale'	Pearson Correlation	-.857**	1.000
	Sig. (2-tailed)	.000	.
	N	12	12

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

SPSS presents a "correlation matrix"- you should notice
-- The correlation between a variable and itself is perfect (1.00)
-- The correlation matrix is symmetrical (look at the upper right and lower left correlations)

The correlation of -.857 indicates that there is a significant **negative** linear relationship between these variables -- as the number of fish increases, the quality of those fish tends to decrease

SPSS reports the sample size (N), but you should report the degrees of freedom (df = N - 2)

Remember, never report p = .000, because that would suggest there is no possibility that the results are mistaken. Always substitute a "1" for the last "0".

Reporting the Results:

Pearson's correlation between the number of fish displayed in these stores (M = 23.92, S = 9.61)and the quality rating for the fish (M = 6.67, S = 2.15) was r(10) = -.86, p<.05. This result supports the research hypothesis that those stores with fewer fish tended to have healthier fish, whereas those stores with more fish tended to have fish with lower health quality.

Another way to report the results is to drop the univariate statistics from the reporting paragraph and instead provide a table similar to that shown below.

Table 1.
Univariate data summary (n=12)

Variable	Mean	Std
Number of fish at store	23.92	9.61
Rating of fish quality	6.67	2.51