**Example of Correlation and Simple Regression**

We want to examine the relationship between anxiety levels and phobia towards insects in a sample of individuals. The data can be found at: <http://www.uv.es/mperea/corr.xls>, <http://www.uv.es/mperea/corr.jasp>, or <http://www.uv.es/mperea/corr.csv>. (The solved data are available at: <http://www.uv.es/mperea/corr2.xls>). Although the exercise can be performed in JASP, it can also be viewed in Excel if preferred.

1. How many subjects are in the sample?
2. Is there an (approximately) linear relationship between anxiety and degree of phobia? (Create the scatter plot.)
3. What is Pearson's correlation coefficient? What does it indicate?
4. Knowing that there is a relationship between anxiety and insect\_phobia, we want to predict the degree of insect phobia based on the level of anxiety. State the regression line of insect\_phobia based on anxiety (raw scores; but also indicate the line using differential and standard scores).
5. In a new column, show the predicted scores from the regression line for each participant’s phobia (based on anxiety).
6. In a new column, show the prediction errors for insect\_phobia, that is, the differences between the observed phobia (Y) and the phobia predicted by the line (Y’).
7. Calculate the variance of the observed scores in insect\_phobia. This is the total variance of Y.
8. Calculate the variance of the predicted scores in insect\_phobia. This is the variance explained by the regression equation. (If there were no relationship between X and Y, this variance would be 0.)
9. Calculate the variance of the prediction errors for insect\_phobia. This is the unexplained variance by the regression equation.
10. What relationship do you observe between the three variances?
11. We know that the coefficient of determination (correlation coefficient squared) indicates the proportion of variance explained by the regression equation with respect to the total variance of the variable Y. Verify this.