

Correlation Ratio

Correlation ratio is a coefficient of non-linear association. In the case of linear relationships, the correlation ratio that is denoted by eta becomes the correlation coefficient. In the case of non-linear relationships, the value of the correlation ratio is greater, and therefore the difference between the correlation ratio and the correlation coefficient refers to the degree of the extent of the non-linearity of relationship.

In [SPSS](#), **correlation ratio** can be performed by selecting "compare means" from the "analyze" menu. This is where the researcher selects "means" and then from the "options" menu, the researcher goes for the "[ANOVA](#) table" and eta which is the correlation ratio.

The correlation ratio is a useful measure of strength of association based on the sum of squares in the context of analysis of variance, however, it can be used outside of the context of analysis of variance. The square of the correlation ratio, which is the eta square, is computed as the division between the between group sum of squares and the total sum of squares.

The correlation ratio is equal to the square root of the sum of squares for an interval type of variable, which has been grouped as between type variables divided by the total sum of squares.

The value of the numerator and the denominator play an important role in defining the extent of linearity or non-linearity among the variables. If the numerator is as large as the denominator, then the value of the correlation ratio will approach one.

Assumptions:

- The correlation ratio defines the relationship or the association which is perfect in nature as a curvilinear relationship and the null relationship as the statistical independence. The researcher should keep in mind that the perfect association as curvilinear depicts that the correlation ratio is not affected with the order of the classes of the categorical variable.
- The correlation ratio assumes asymmetry, or, one can say that it is asymmetric in nature. In other words, unlike [Pearson's correlation](#), the researcher will get different values for the coefficient depending upon the type of independent and dependent variables.
- The correlation ratio cannot prove causal direction like other types of correlations and associations, however, it can measure the level of causal direction. It is for this reason the correlation ratio does not have any sign and only varies from zero to one.

While computing the correlation ratio, the researcher should take the interval or ratio level of the dependent variable.

The researcher should consider the second variable as the categorical type of variable having several numbers of categories that are arranged in order. In other words, the categorical variable

can be of any data level inclusive of the nominal type. Generally, while computing the correlation ratio, the researcher makes the categorical variable the independent variable.

The frequencies of each of the classes of the categorical variable in correlation ratio should be high. The frequencies should be high in correlation ratio because this results in a valid result or stabilized result to the means of the classes.

It is often required that the interval level of the variables should be grouped into ranges in order to make sure that there exists sufficient numbers of the categorical values that correspond to each of the interval level of values.

Related Pages:

- [Correlation \(Pearson, Kendall, Spearman\)](#)
- [Conduct and Interpret a Bivariate \(Pearson\) Correlation](#)

To Reference Page: Statistics Solutions. (2013). Correlation Ratio [WWW Document]. Retrieved from [here](#).