Summary

- In statistics, the correlation ratio is a measure of the relationship between the statistical dispersion within individual categories and the dispersion across the whole population or sample. The measure is defined as the ratio of two standard deviations representing these types of variation. The context here is the same as that of the intra-class correlation coefficient, whose value is the square of the correlation ratio

- The correlation ratio η takes values between 0 and 1

- Correlation ratio was introduced by Karl Pearson as part of analysis of variance. Ronald A. Fisher commented "as a descriptive statistic the utility of the correlation ratio is extremely limited. It will be noticed that the number of degrees of freedom in the numerator of depends on the number of the arrays"

- The correlation coefficient 'r' is a good measure of correlation only when the regression is linear. It is necessary, therefore, before placing any reliance upon the computed 'r' to examine the data for linearity of the regression lines. One common test of linearity, Blakeman's, compares the value of $\eta^2 - r^2$ with its probable error, η being a correlation ratio. In applying this test it is then necessary to calculate along with r the correlation ratios

- Intra-class correlation means within class correlation. It is distinguishable from product moment correlation in as much as here both the variables measure the same characteristics. Sometimes especially in biological and agricultural study, it is of interest to know how the members of a family or group are correlated among themselves with respect to some one of their common characteristic. For example, we may require the correlation between the heights of brothers of a family or between yields of plots of an experimental block. In such cases both the variables measure the same characteristic, example, height and height or weight or weight. There is nothing to distinguish one from the other so that one may be treated as X variable and the other as the Y variable

- The range for intra-class correlation coefficient is $-\dfrac{1}{k-1} \leq r \leq 1$