

How can I calculate Cohen's Kappa in R?

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Cohen's Kappa is a statistical measure of inter-rater agreement, commonly used in the field of social sciences to assess the level of agreement between two or more raters or observers. In order to calculate Cohen's Kappa in R, one must first have a dataset containing the ratings or observations of the raters. The next step is to use the "irr" package, which provides functions for calculating Cohen's Kappa and other measures of agreement. The "kappa2" function in the "irr" package can be used to calculate Cohen's Kappa, taking into account the number of raters and categories in the dataset. The output of this function will provide the value of Cohen's Kappa, indicating the level of agreement between the raters. This measure can be useful in evaluating the reliability and consistency of ratings or observations in a study.

Calculate Cohen's Kappa in R

In statistics, is used to measure the level of agreement between two raters or judges who each classify items into mutually exclusive categories.

The formula for Cohen's kappa is calculated as:

$$k = (po - pe) / (1 - pe)$$

where:

po: Relative observed agreement among raters
pe: Hypothetical probability of chance agreement

Rather than just calculating the percentage of items that the raters agree on, Cohen's Kappa attempts to account for the fact that the raters may happen to agree on some items purely by chance.

The value for Cohen's Kappa always ranges between 0 and 1 where:

0 indicates no agreement between the two raters
1 indicates perfect agreement between the two raters

The following table summarizes how to interpret different values for Cohen's Kappa:

Cohen's Kappa	Interpretation
0	No agreement
0.10 - 0.20	Slight agreement
0.21 - 0.40	Fair agreement
0.41 - 0.60	Moderate agreement
0.61 - 0.80	Substantial agreement
0.81 - 0.99	Near perfect agreement
1	Perfect agreement

The easiest way to calculate Cohen's Kappa in R is by using the `cohen.kappa()` function from the `psych` package.

The following example shows how to use this function in practice.

Example: Calculating Cohen's Kappa in R

Suppose two art museum curators are asked to rate 15 paintings on whether they're good enough to be shown in a new exhibit.

The following code shows how to use the `cohen.kappa()` function from the `psych` package to calculate Cohen's Kappa for the two raters:

```
library(psych)#define vector of ratings for both raters  
rater1 =  
rater2 =  
  
#calculate Cohen's Kappa  
cohen.kappa(x=cbind(rater1,rater2))
```

Cohen Kappa and Weighted Kappa correlation coefficients and confidence boundaries

	lower estimate	upper
unweighted kappa	-0.14	0.34 0.81
weighted kappa	-0.14	0.34 0.81

Number of subjects = 15

The estimate column displays the value for Cohen's Kappa.

Based on the table from earlier, we would say that the two raters only had a "fair" level of agreement.

If you want to calculate the level of agreement between three or more raters, it's recommended to use Fleiss' Kappa instead.

The following tutorials offer additional resources on Cohen's Kappa:

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