

# How can I calculate Cohen's Kappa in Excel?

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## RECOMMENDED CITATION

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Cohen's Kappa is a statistical measure used to assess the agreement between two raters or observers. It is commonly used in fields such as psychology, medicine, and social sciences. To calculate Cohen's Kappa in Excel, one must first determine the observed agreement between the two raters and the expected agreement based on chance. This can be done by creating a contingency table in Excel and using the appropriate formulas to calculate the observed and expected agreement. The Kappa value can then be calculated by dividing the difference between the observed and expected agreement by the maximum possible difference and multiplying it by 100. This can be easily done in Excel using the Kappa formula. Additionally, there are several Excel add-ins available that can automate this process and provide a more accurate calculation of Cohen's Kappa. Overall, calculating Cohen's Kappa in Excel can provide a convenient and efficient way to measure inter-rater agreement.

## Calculate Cohen's Kappa in Excel

**Cohen's Kappa 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:**

$$k = (p_o - p_e) / (1 - p_e)$$

**where:**

**$p_o$ : Relative observed agreement among raters**  
 **$p_e$ : 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, with 0 indicating no agreement between the two raters and 1 indicating 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 following example shows how to calculate Cohen's Kappa in Excel.**

**Example: Calculating Cohen's Kappa in Excel**

**Suppose two art museum curators are asked to rate 70 paintings on whether they're good enough to be shown in a new exhibit.**

The following 2×2 table shows the results of the ratings:

	A	B	C	D	E	F	G
1			Rater 2		Total		
2			Yes	No			
3	Rater 1	Yes	25	10	35		
4		No	15	20	35		
5	Total		40	30	70		
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

The following screenshot shows how to calculate Cohen's Kappa for the two raters, including the formulas used:

	A	B	C	D	E	F
1			Rater 2		Total	
2			Yes	No		
3	Rater 1	Yes	25	10	35	
4		No	15	20	35	
5	Total		40	30	70	
6						
7						
8	$p_o$	0.6429	=(C3+D4)/SUM(C3:D4)			
9	$p_e$	0.5	=MMULT(C5:D5, E3:E4)/E5^2			
10	$k$	0.2857	=(B8-B9)/(1-B9)			
11						
12						
13						
14						
15						
16						

The  $p_o$  value represents the relative agreement between the raters. This is the proportion of total ratings that the raters both said "Yes" or both said "No" on.

The  $p_e$  value represents the probability that the raters could have agreed purely by chance.

This turns out to be 0.5.

The  $k$  value represents Cohen's Kappa, which is calculated as:

$$k = (p_o - p_e) / (1 - p_e) = (0.6429 - 0.5) / (1 - 0.5) = 0.2857$$

**Cohen's Kappa turns out to be 0.2857.**

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

**Additional Resources**

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

ARABPSYCHOLOGY.COM