

chi-square statistic (χ^2 , X^2)

A score that equals the sum of normalized squared deviations between observed *outcomes* and expected outcomes (\rightarrow *observation, expectation*):

$$\chi^2 = \sum_{i=1}^n \frac{(E_i - O_i)^2}{E_i}$$

where each O_i is an outcome and E_i is the corresponding expectation.

The statistic can be used in a χ^2 test for goodness of fit or a χ^2 test for independence. See *chi-square distribution, contingency table*. The symbol χ^2 is used for both the distribution and the corresponding statistic. Sometimes the upper case X^2 is used for the statistic to avoid confusion.