



Chi-Square Method (χ^2)

The chi-square test represent one of the most useful, versatile and widely applicable method of comparing experimentally obtained results with those theoretically expected, based on some hypothesis.

PHONES

It is used with data in the form of Frequency of data that can be reduced to Frequencies. This include proportion and probabilities. Thus a hypothesis of data involving more than one set can be tested for significance. chi-square test is applied

to find association between two events occurring, together when there are more than two samples.

MARCH	2000												
S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31								

$$\chi^2 = \sum \left[\frac{(O - E)^2}{E} \right]$$

Where, O = observed number of trials

E = expected number of trials

χ^2 = Symbol of chi-square because the 2nd letter of Greek alphabet is χ (chi)

Example: In a cross between tall (T) and dwarf (t), 1574 tall and 554 dwarf were obtained. Suggest if a ratio of 3:1 is suitable or not?

WORK TO DO

Calculation:

① Total number = $1574 + 554 = 2128$.

② So expected 3:1 ratio will be 1596 : 532.

③ Observed ratio is 1574 : 554

④ Then considering the 2 classes tall and dwarf (i.e. T & t)

$$\chi^2 = \frac{(1574 - 1596)^2}{1596} + \frac{(554 - 532)^2}{532}$$

PHONES

$$= \frac{(-22)^2}{1596} + \frac{(22)^2}{532} = \frac{484}{1596} + \frac{484}{532}$$

5 SUNDAY

$$= 0.30 + 0.91$$

$$= 1.21$$

Referring to the table of χ^2 , it shows that obtained results is a very good fit to 3:1 ratio.

APRIL														2000							
S	M	T	W	T	F	S	S	M	T	W	T	F	S								
														1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16	17	18	19	20	21	22								
23	24	25	26	27	28	29	30														