

PRACTICE 11: The Chi-square (χ^2) test of association for non-parametric data

The Chi-square (χ^2) formula for comparing non-parametric data:

$$\chi_{emp}^2 = \frac{(f_e - f_t)^2}{f_t}; \quad P = \frac{n_{toifa}}{N_{jami}};$$

How to calculate:

The empirical indicator of sports participation	School 1	School 2
The number of sports participants	90	54
The number of non-participants in sports	20	44
Total:	110	98

$$P = \frac{20+44}{110+98} = 0.31;$$

$$f_{t1} * 0.31; 110 = 34.1$$

$$f_{t2} * 0.31; 98 = 30.38$$

$$f_{t3} = 110 - 34.1 = 75.9$$

$$f_{t4} = 98 - 30.38 = 67.62$$

The empirical indicator of sports participation	School 1	School 2
The number of sports participants	$f_{t3} = 75.9$	$f_{t4} = 67.62$
The number of non-participants in sports	$f_{t1} = 34.1$	$f_{t2} = 30.38$
Total:	110	98

$$\chi_{emp}^2 = \frac{(20-34.1)^2}{34.1} + \frac{(44-30.38)^2}{30.38} + \frac{(90-75.9)^2}{75.9} + \frac{(54-67.62)^2}{67.62} = \mathbf{17.3}$$