



CHI- SQUARE TEST OF HOMOGENEITY

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- this test is concerned with two or more samples, with only one criterion variable.
- it is used to determine if two or more population are homogeneous.



HOMOGENEOUS

- The same or similar nature or kind.
- Uniform in structure or composition throughout



WHEN DO WE USE THE CHI-SQUARE OF HOMOGENEITY?

- when we compare *significant difference* between two or more groups.



HOW DO WE USE THE CHI-SQUARE TEST OF HOMOGENEITY?

- use the formula for a 2x2 contingency table

$$X^2 = \frac{N (ad - bc)^2}{klmn}$$

where:

X^2 = chi-square test

N = grand total

$klmn$ = the product of the rows and columns



- For a 2x2 contingency table label the different cells

			TOTAL
	a	b	k
	c	d	l
TOTAL	m	n	N



EXAMPLE

- To illustrate this, we can evaluate the attitude of sample of Lakas and Laban parties on the issue of peace and order in Mindanao. To carry out such study, a separate random sample of members of each party is drawn from the nationwide population of Lakas and Laban and each individual in both samples responds to the scale. Scores are then classified into “Favorable” or “Unfavorable” categories.

The following frequencies are obtained:

	FAVORABLE	UNFAVORABLE	TOTAL
LAKAS	65 (a)	35 (b)	100 (k)
LABAN	50 (c)	50 (d)	100(l)
TOTAL	115 (m)	85 (n)	200 (N)

$$\begin{aligned}
 \chi^2 &= \frac{N(ad - bc)^2}{klmn} \\
 &= \frac{200[(65)(50) - (35)(50)]^2}{(100)(100)(115)(85)}
 \end{aligned}$$



SOLVING BY THE STEPWISE METHOD

I. **PROBLEM:** Is there a significant difference between the attitudes of the two political parties on the issue of peace and order in Mindanao?

II. **HYPOTHESES:**

H_0 : There is no significant difference between the attitudes of the two political parties on the issue of peace and order in Mindanao.

H_1 : There is a significant difference between the attitudes of the two political parties on the issue of peace and order in Mindanao.



III. LEVEL OF SIGNIFICANCE

$$a = 0.05$$

$$\begin{aligned}df &= (c-1)(r-1) \\ &= (2-1)(2-1) \\ &= (1)(1) \\ &= 1\end{aligned}$$

$$X^2_{.05} = 3.841$$



Degrees of Freedom	Probability										
	0.95	0.90	0.80	0.70	0.50	0.30	0.20	0.10	0.05	0.01	0.001
1	0.004	0.02	0.06	0.15	0.46	1.07	1.64	2.71	3.84	6.64	10.83
2	0.10	0.21	0.45	0.71	1.39	2.41	3.22	4.60	5.99	9.21	13.82
3	0.35	0.58	1.01	1.42	2.37	3.66	4.64	6.25	7.82	11.34	16.27
4	0.71	1.06	1.65	2.20	3.36	4.88	5.99	7.78	9.49	13.28	18.47
5	1.14	1.61	2.34	3.00	4.35	6.06	7.29	9.24	11.07	15.09	20.52
6	1.63	2.20	3.07	3.83	5.35	7.23	8.56	10.64	12.59	16.81	22.46
7	2.17	2.83	3.82	4.67	6.35	8.38	9.80	12.02	14.07	18.48	24.32
8	2.73	3.49	4.59	5.53	7.34	9.52	11.03	13.36	15.51	20.09	26.12
9	3.32	4.17	5.38	6.39	8.34	10.66	12.24	14.68	16.92	21.67	27.88
10	3.94	4.86	6.18	7.27	9.34	11.78	13.44	15.99	18.31	23.21	29.59
	Nonsignificant								Significant		

III. DECISION RULE

If the chi-square computed value is greater than the chi-square tabular value, disconfirm H_0 .



	FAVORABLE	UNFAVORABLE	TOTAL
LAKAS	65 (a)	35 (b)	100 (k)
LABAN	50 (c)	50 (d)	100(l)
TOTAL	115 (m)	85 (n)	200 (N)

$$\begin{aligned}
 \chi^2 &= \frac{N(ad - bc)^2}{klmn} \\
 &= \frac{200[(65)(50) - (35)(50)]^2}{(100)(100)(115)(85)}
 \end{aligned}$$



$$\begin{aligned} X^2 &= \frac{N(ad - bc)^2}{klmn} \\ &= \frac{200[(65)(50) - (35)(50)]^2}{(100)(100)(115)(85)} \\ &= \frac{200[3250 - 1750]^2}{97750000} \\ &= \frac{200(1500)^2}{97750000} \\ &= \frac{450000000}{97750000} \end{aligned}$$

$$X^2 = 4.604$$



IV. CONCLUSION

Since the chi-square computed value of **4.604** is greater than the chi-square tabular value of 3.481 at .05 level of significance with 1 degree of freedom, the null hypothesis is rejected. This means that there is a significant difference between the attitudes of the two political parties on the issue of peace and order in Mindanao. It implies that the Lakas group has a favorable attitude while those of the Laban group have a neutral attitude towards the issue.

