

Pearson Chi-Square Test

Pearson Chi-Square Test

Import and test-specific preparation

Dataset Name

Notes

Output Created		16-JUL-2026 14:42:59
Comments		
Input	Data	D:\DATA ANALYSIS\Chi Square and Categorical Data Tests\Pearson Chi Square Test\dataset.csv
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		DATASET NAME PearsonChiSquareTestData.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

The active dataset will replace the existing dataset named PearsonChiSquareTestData.

school into school_n
Old Value New Value Value Label

GP	1	GP
MS	2	MS

reason into reason_n
Old Value New Value Value Label

course	1	course
home	2	home
other	3	other
reputation	4	reputation

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guardian into guardian_n

Old Value	New Value	Value Label
father	1	father
mother	2	mother
other	3	other

Pearson chi-square test

Pearson chi-square test
Sex by four-level final-grade band

Crosstabs

Notes

Output Created		16-JUL-2026 14:43:01
Comments		
Input	Data	D:\DATA ANALYSIS\Chi Square and Categorical Data Tests\Pearson Chi Square Test\dataset.csv
	Active Dataset	PearsonChiSquareTestData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=sex_bin BY grade3 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI /CELLS=COUNT ROW COLUMN EXPECTED RESID SRESID /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01
	Dimensions Requested	2
	Cells Available	524245

[PearsonChiSquareTestData]

Pearson chi-square test
Sex by four-level final-grade band

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Sex: 0 female, 1 male * G3 ordinal grade band	649	100.0%	0	0.0%	649	100.0%

Sex: 0 female, 1 male * G3 ordinal grade band Crosstabulation

			G3 ordinal grade band	
			Low below 10	Medium 10-13
Sex: 0 female, 1 male	Female	Count	50	204
		Expected Count	59.0	209.5
		% within Sex: 0 female, 1 male	13.1%	53.3%
		% within G3 ordinal grade band	50.0%	57.5%
		Residual	-9.0	-5.5
		Standardized Residual	-1.2	-.4
	Male	Count	50	151
		Expected Count	41.0	145.5
		% within Sex: 0 female, 1 male	18.8%	56.8%
		% within G3 ordinal grade band	50.0%	42.5%
		Residual	9.0	5.5
		Standardized Residual	1.4	.5
	Total	Count	100	355
		Expected Count	100.0	355.0
		% within Sex: 0 female, 1 male	15.4%	54.7%
		% within G3 ordinal grade band	100.0%	100.0%

Pearson chi-square test
Sex by four-level final-grade band

Sex: 0 female, 1 male * G3 ordinal grade band Crosstabulation

			G3 ordinal grade band		Total
			High 14-16	Very high 17+	
Sex: 0 female, 1 male	Female	Count	96	33	383
		Expected Count	87.3	27.1	383.0
		% within Sex: 0 female, 1 male	25.1%	8.6%	100.0%
		% within G3 ordinal grade band	64.9%	71.7%	59.0%
		Residual	8.7	5.9	
		Standardized Residual	.9	1.1	
	Male	Count	52	13	266
		Expected Count	60.7	18.9	266.0
		% within Sex: 0 female, 1 male	19.5%	4.9%	100.0%
		% within G3 ordinal grade band	35.1%	28.3%	41.0%
		Residual	-8.7	-5.9	
		Standardized Residual	-1.1	-1.3	
Total	Count		148	46	649
	Expected Count		148.0	46.0	649.0
	% within Sex: 0 female, 1 male		22.8%	7.1%	100.0%
	% within G3 ordinal grade band		100.0%	100.0%	100.0%

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Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	8.886 ^a	3	.031
Likelihood Ratio	9.008	3	.029
Linear-by-Linear Association	8.869	1	.003
N of Valid Cases	649		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.85.

Symmetric Measures

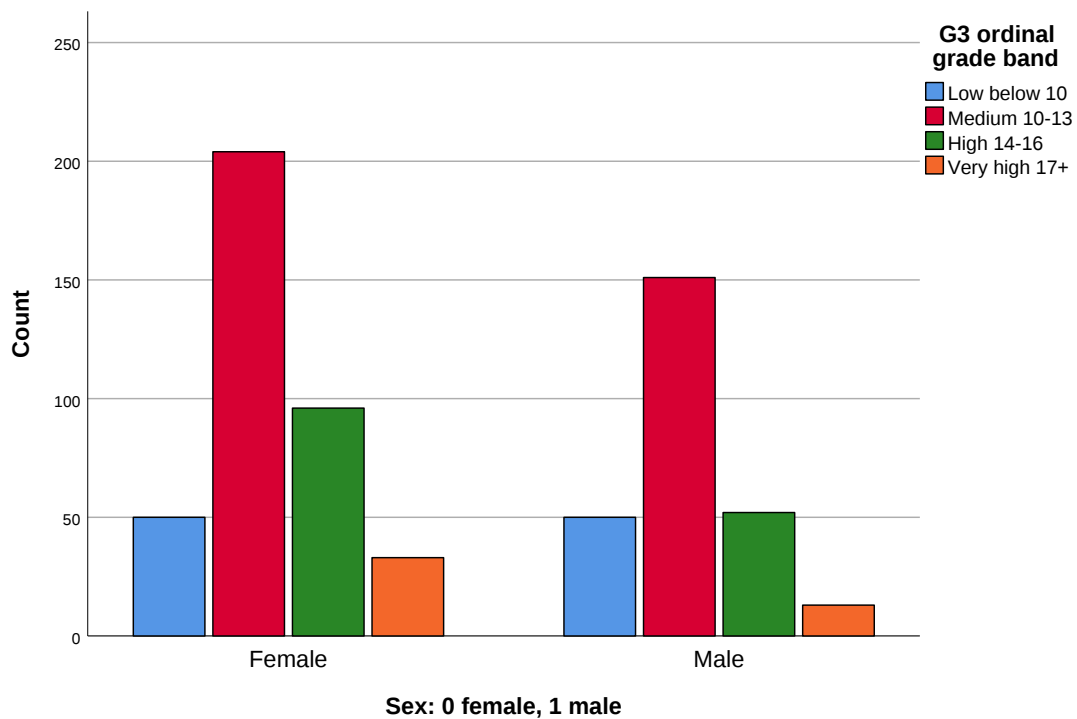
		Value	Approximate Significance
Nominal by Nominal	Phi	.117	.031
	Cramer's V	.117	.031
N of Valid Cases		649	

Graph

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	Active Dataset	PearsonChiSquareTestData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /BAR(GROUPED) =COUNT BY sex_bin BY grade3.
Resources	Processor Time	00:00:00.37
	Elapsed Time	00:00:00.39



Pearson chi-square test
Sex by four-level final-grade band

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PEARSON CHI-SQUARE TEST
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Formula:  $X^2 = \sum_{ij} (O_{ij} - E_{ij})^2 / E_{ij}$ 
Variables: sex, G3 grade band
cells_expected_below_5 = 0
cramers_v = 0.11701043260874072
degrees_of_freedom = 3
minimum_expected_count = 18.853620955315872
p_value = 0.030849172453314578
statistic = 8.88574542919574
Cross-check status: pass
=====
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```