Boschloo's Test

Test name: Boschloo's Test

Dataset: D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Boschloos Test\dataset.csv

Rows in original dataset: 649

Columns in original dataset: 33

Rows used in the 2 x 2 analysis: 649

Independent group source: sex

Binary outcome source: G3

Group labels: F and M

Outcome labels: G3 >= 10 and G3 < 10

Primary method: Boschloo's unconditional exact test, two-sided.

Boschloo Fisher-p statistic: 0.03049279

Boschloo exact p-value: 0.0513872452

Decision at alpha = 0.05: Fail to reject H0: the data do not show a statistically significant group difference.

One-sided less Boschloo p-value: 0.9779287416

One-sided greater Boschloo p-value: 0.0256936226

Approximate less-profile maximum: 0.9779286087 at nuisance p = 0.4550

Approximate greater-profile maximum: 0.0256935703 at nuisance p = 0.5900

Interpretation: Boschloo uses a one-sided Fisher exact p-value as its ordering statistic and maximizes the unconditional tail probability over the common null probability.

The two-sided Boschloo convention is twice the smaller one-sided Boschloo p-value, clipped at 1.

Fisher's exact, Barnard's exact, and Pearson chi-square results are comparison tests only.

Effect measures include group proportions, risk difference, risk ratio, odds ratio, confidence intervals, and Cramer's V.

Assumption: observations are independent and form a valid 2 x 2 table.

Charts generated: 7

Observed 2 x 2 table

group	G3 >= 10	G3 < 10
F	333.000000	50.000000
M	216.000000	50.000000

Primary and comparison tests

test	statistic	df	p_value	role	decision_alpha_0_05
Boschloo exact test	0.030493		0.051387	Primary exact test	Fail to reject H0
Boschloo exact test - less	0.981787		0.977929	One-sided component	Fail to reject H0
Boschloo exact test - grea	0.030493		0.025694	One-sided component	Reject H0
Fisher exact test			0.059797	Comparison only	Fail to reject H0
Barnard exact test	1.992745		0.067160	Comparison only	Fail to reject H0
Pearson chi-square	3.971035	1.000000	0.046289	Asymptotic comparison	Reject H0
Yates corrected chi-square	3.542706	1.000000	0.059808	Asymptotic comparison	Fail to reject H0

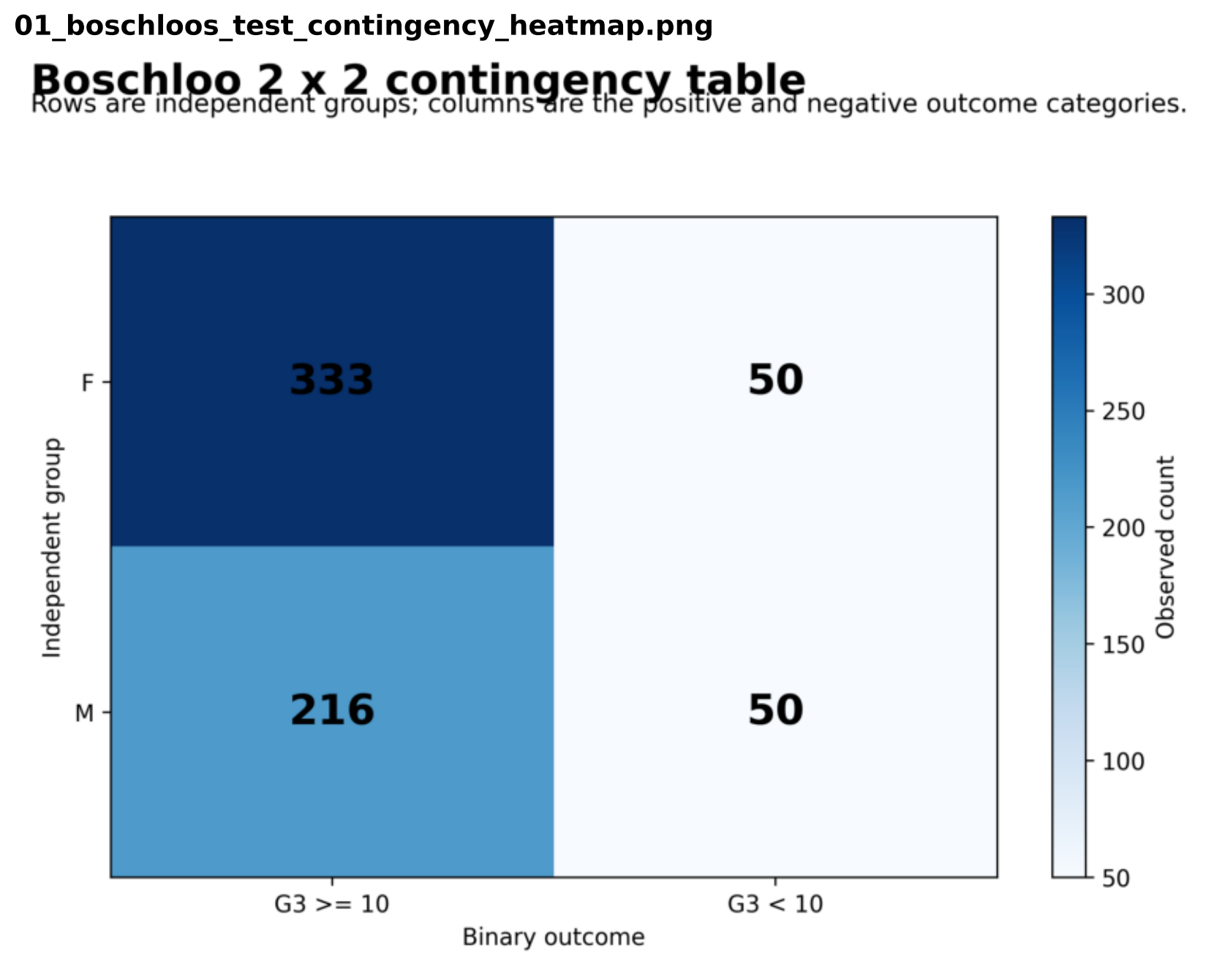
Effect measures

measure	estimate	ci95_lower	ci95_upper	null_value
Outcome proportion - F	0.869452	0.832010	0.899556	
Outcome proportion - M	0.812030	0.760762	0.854414	
Risk difference (M - F)	-0.057422	-0.115238	0.000395	0.000000
Risk ratio (M / F)	0.933957	0.871134	1.001310	1.000000
Odds ratio (M / F)	0.648649	0.422898	0.994909	1.000000
Cramer's V	0.078222			0.000000

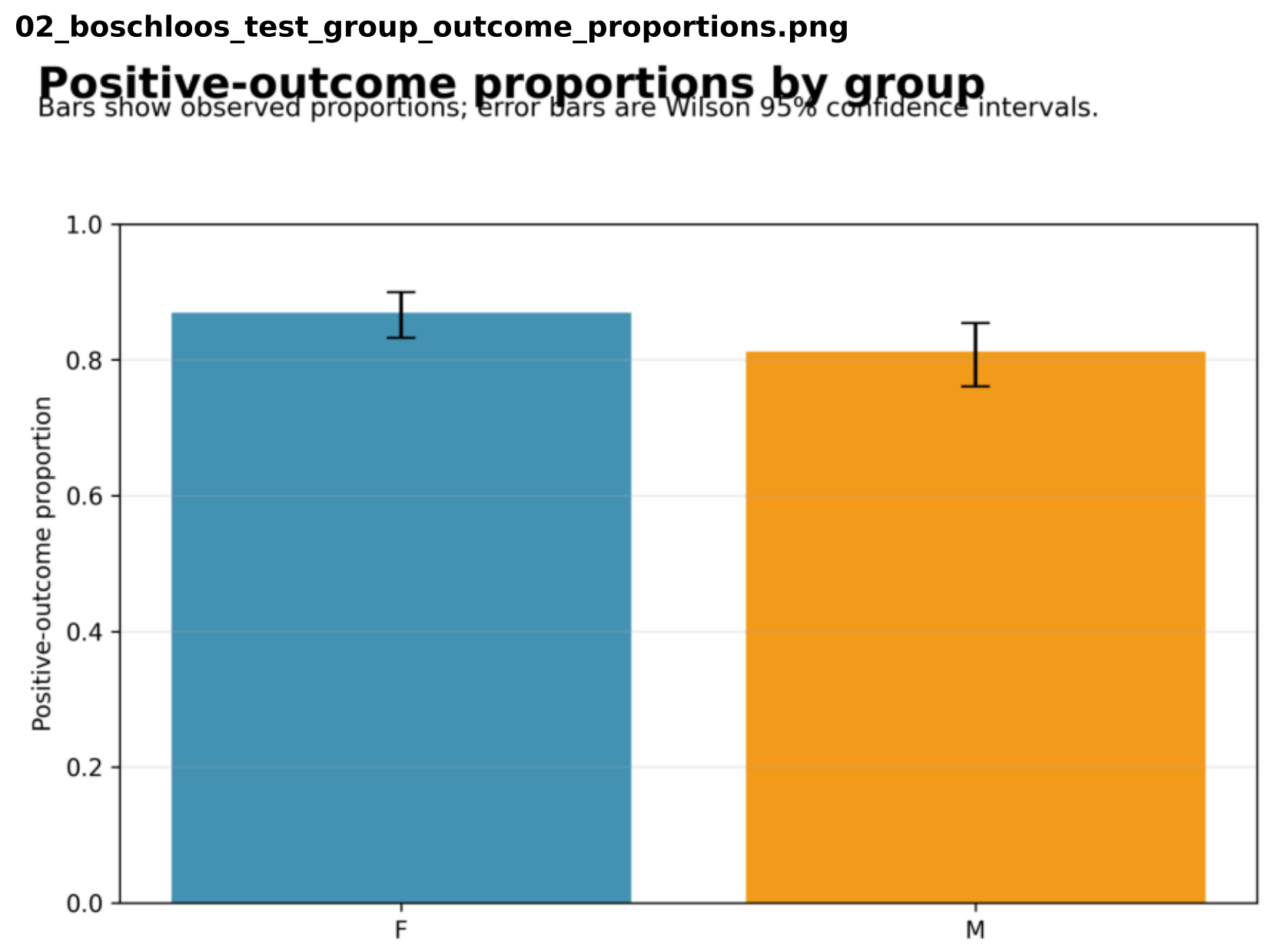
Cell diagnostics

group	outcome	observed	expected	pearson_residual	adjusted_standardized	chi_square_contribution
F	G3 >= 10	333.000000	323.986133	0.500781	1.992745	0.250782
F	G3 < 10	50.000000	59.013867	-1.173368	-1.992745	1.376792
M	G3 >= 10	216.000000	225.013867	-0.600906	-1.992745	0.361088
M	G3 < 10	50.000000	40.986133	1.407968	1.992745	1.982373

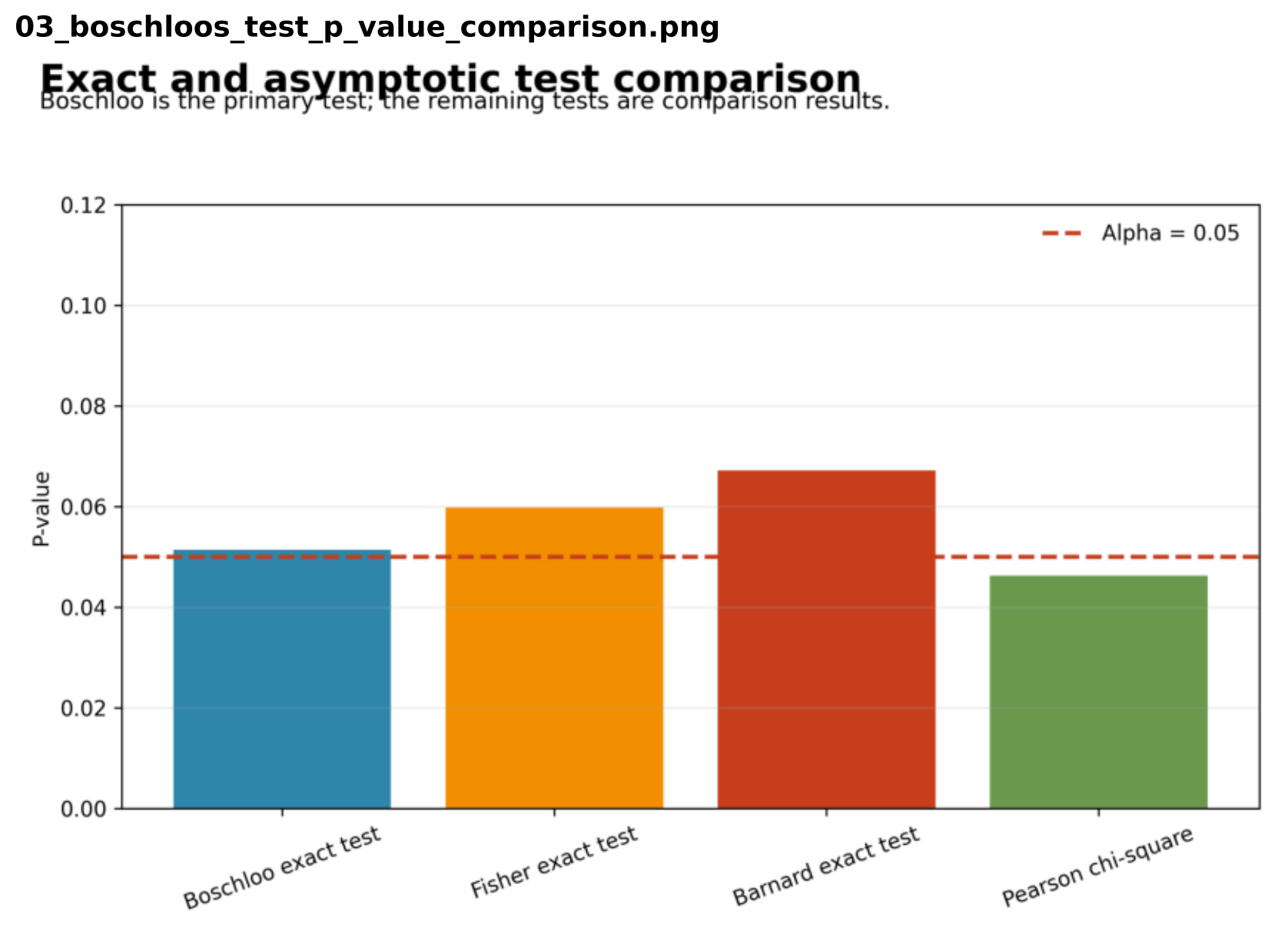
01_boschloos_test_contingency_heatmap.png



02_boschloos_test_group_outcome_proportions.png



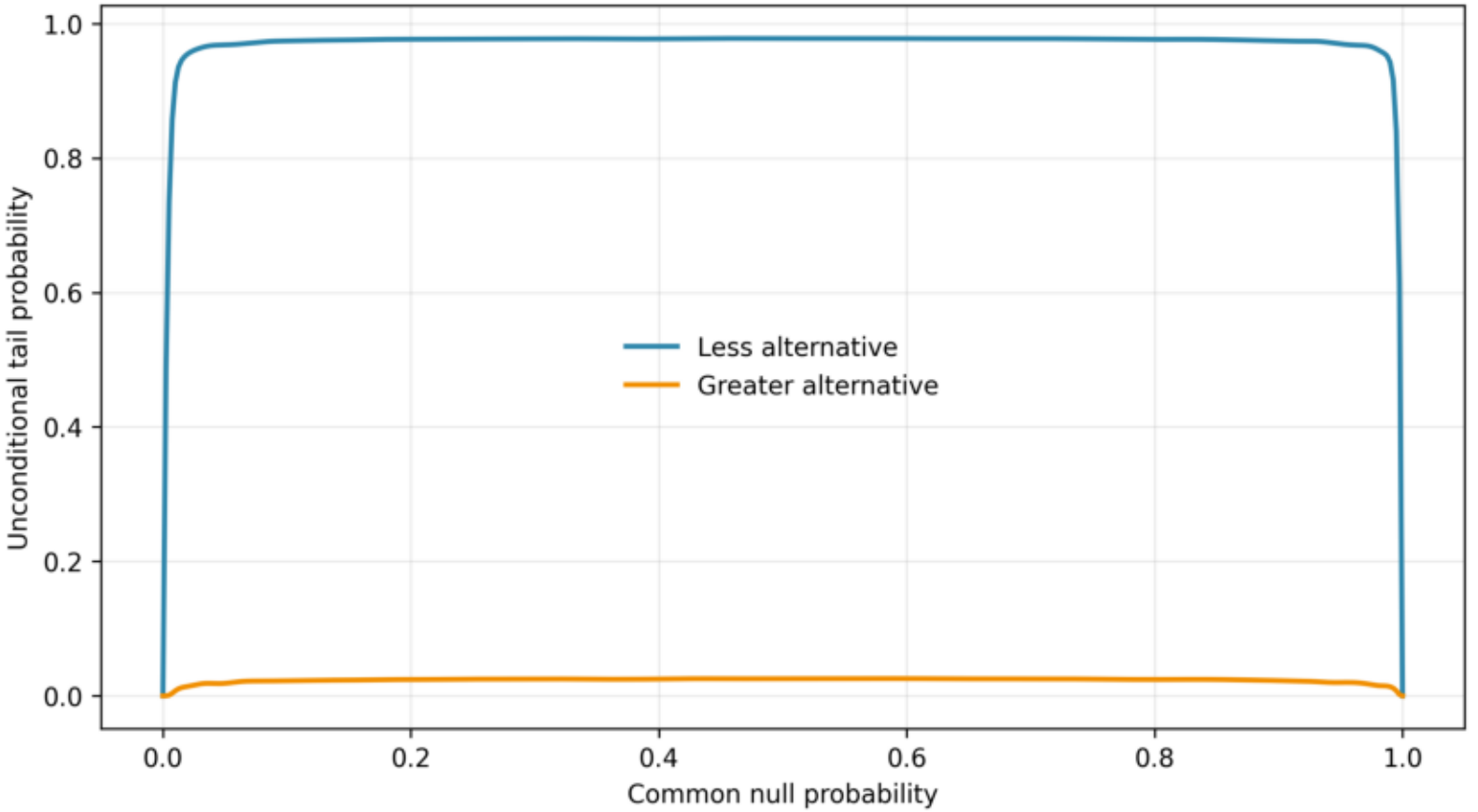
03_boschloos_test_p_value_comparison.png



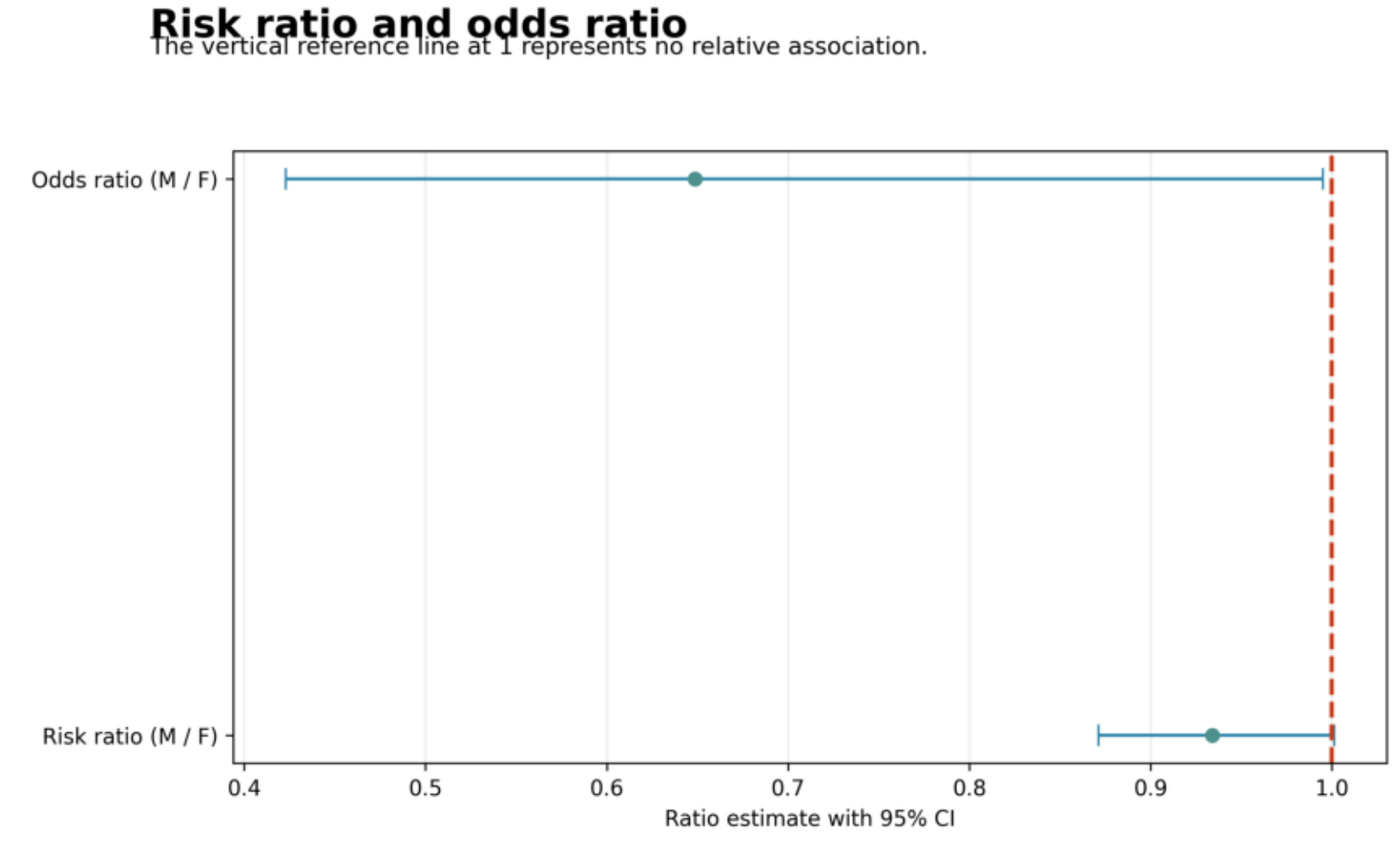
04_boschloos_test_nuisance_parameter_profile.png

Boschloo nuisance-parameter profile

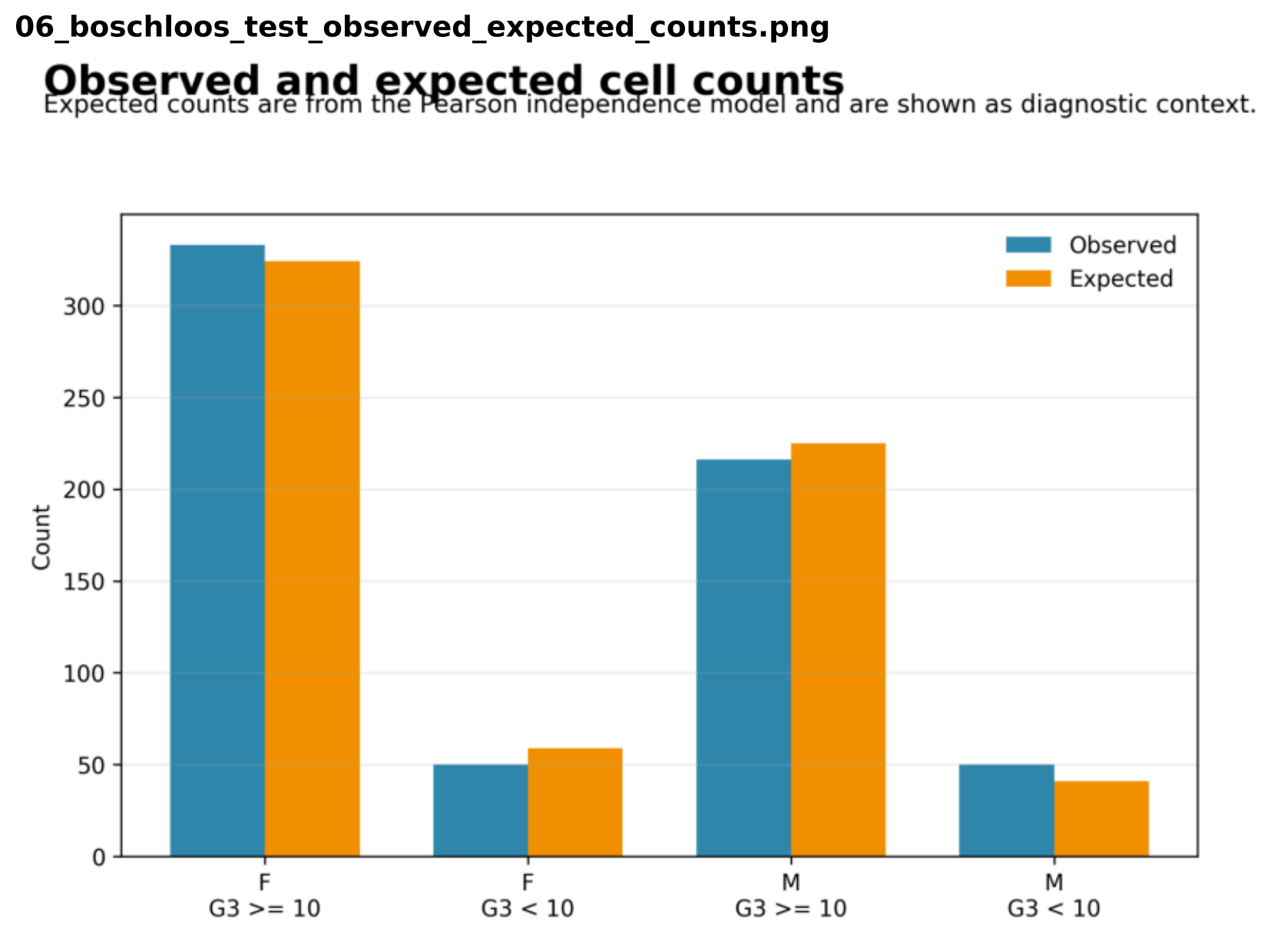
Each curve sums probabilities of tables whose one-sided Fisher p-value is at least as extreme as observed.



05_boschloos_test_ratio_effect_measures.png



06_boschloos_test_observed_expected_counts.png



07_boschloos_test_adjusted_residuals.png