

Cochran-Mantel-Haenszel Row-Mean-Scores Test

Verified Python analysis transcript

Test: Cochran-Mantel-Haenszel Row-Mean-Scores Test

Design: Ordinal final-grade association with sex, controlled for school.

Variables: sex, G3 grade band scores 1-4, school strata

Null hypothesis: Within school strata, the ordinal grade-score distributions do not differ by sex.

Primary formula: $CMH = [\sum_h (T_h - E_h)]^2 / \sum_h \text{Var}(T_h)$, $df = 1$

Valid source rows: 649

Verified results:

cmh_row_mean_score_statistic: 12.858673126586426

p_value: 0.0003359186940831262

degrees_of_freedom: 1

signed_z: -3.5858992075330876

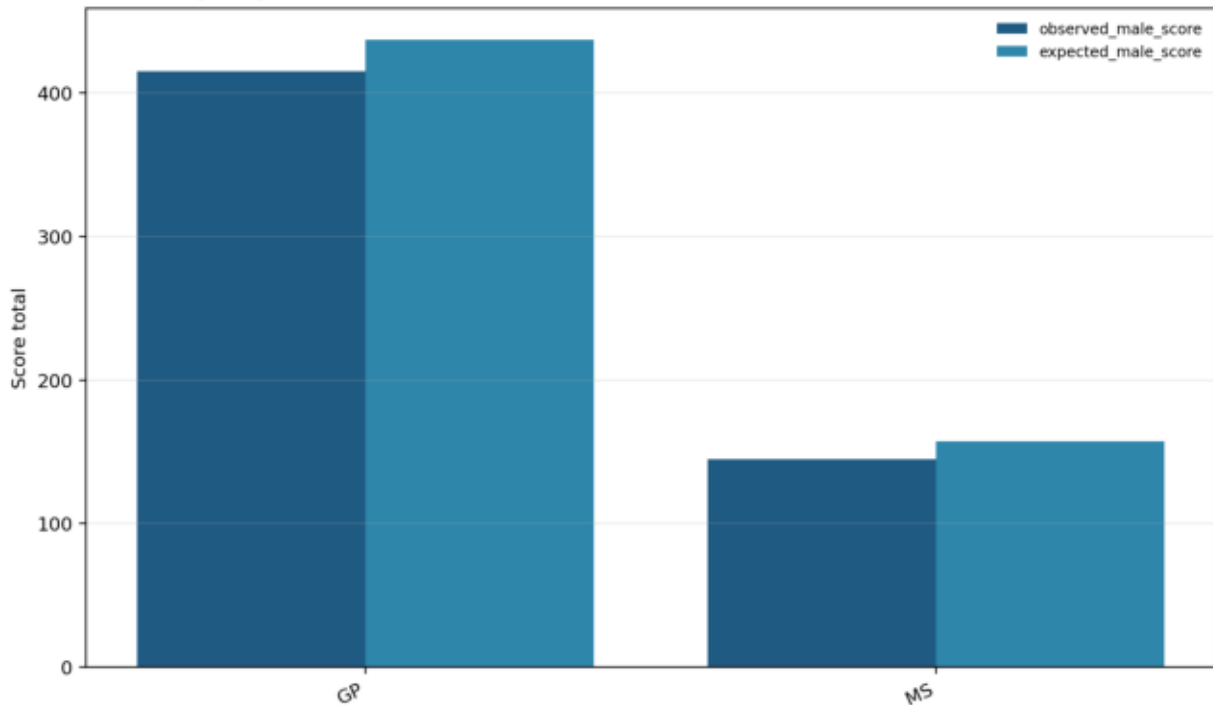
Interpretation:

The ordinal CMH statistic is 12.858673, $z = -3.585899$, $p = 0.000335919$.

The sign of z gives the direction of the male-versus-female ordinal score shift after controlling for school.

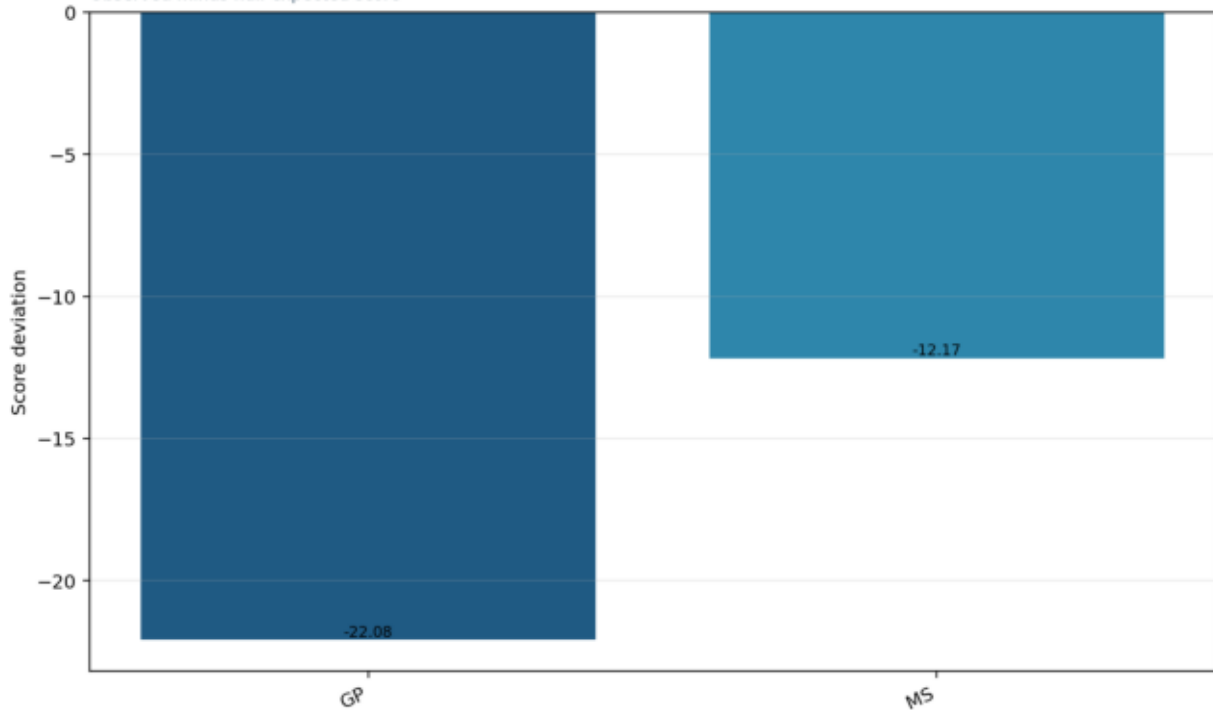
Observed and expected male ordinal scores

Controlled separately within each school



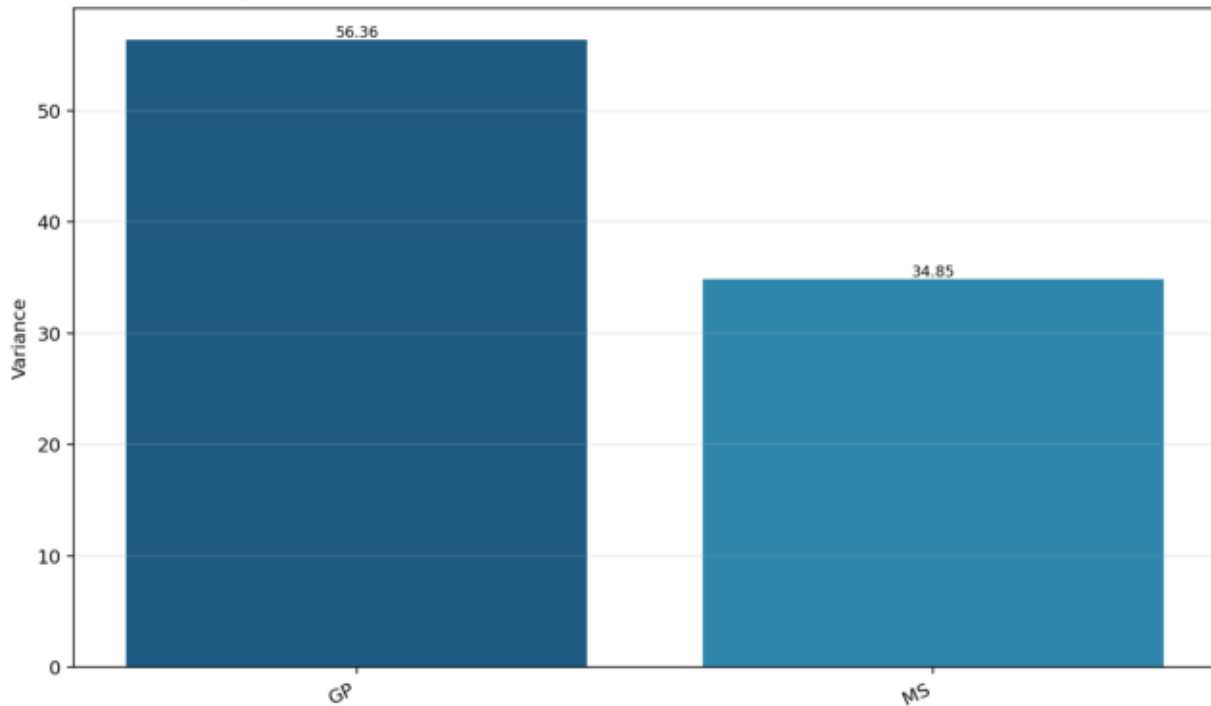
CMH score deviations by school

Observed minus null-expected score



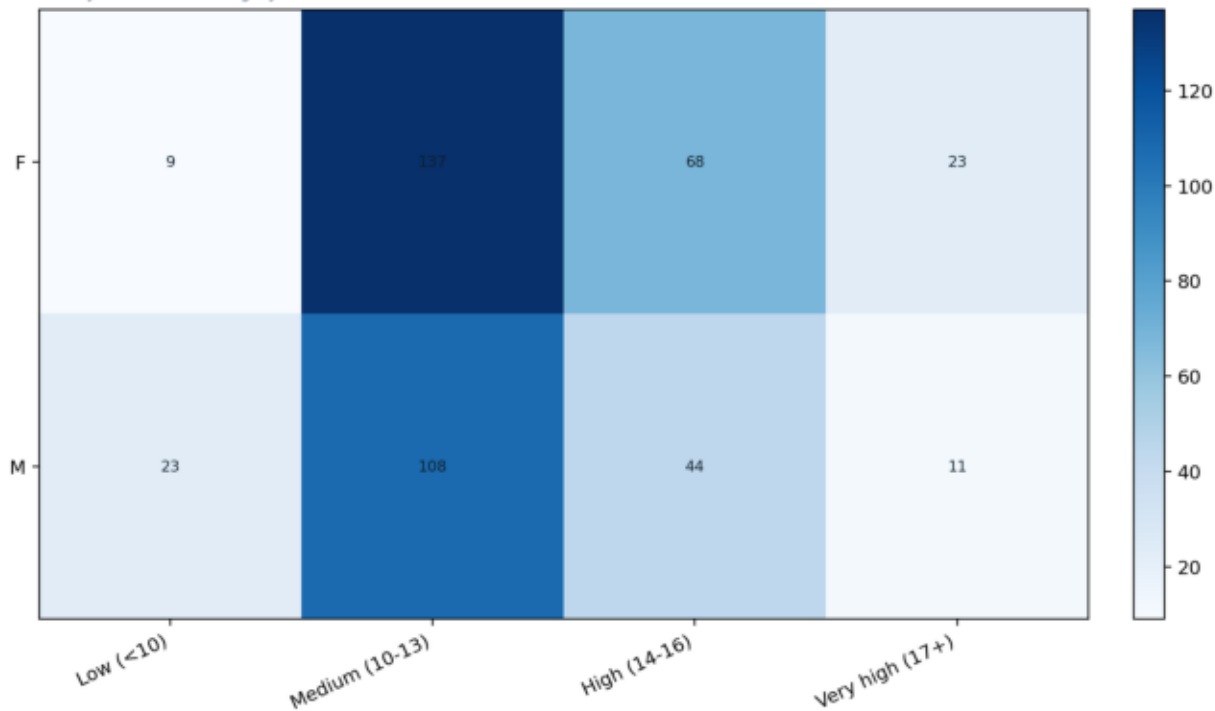
Stratum variance contributions

Information entering the CMH denominator



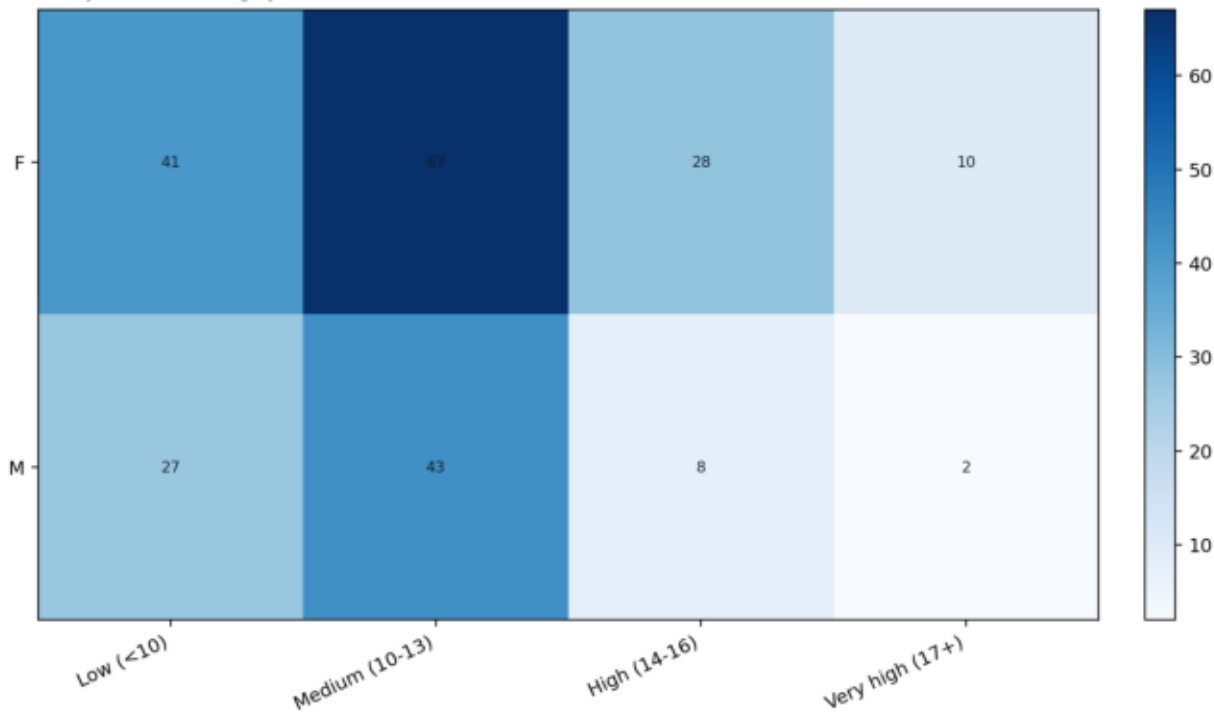
GP ordinal grade table

Sex by ordered G5 category



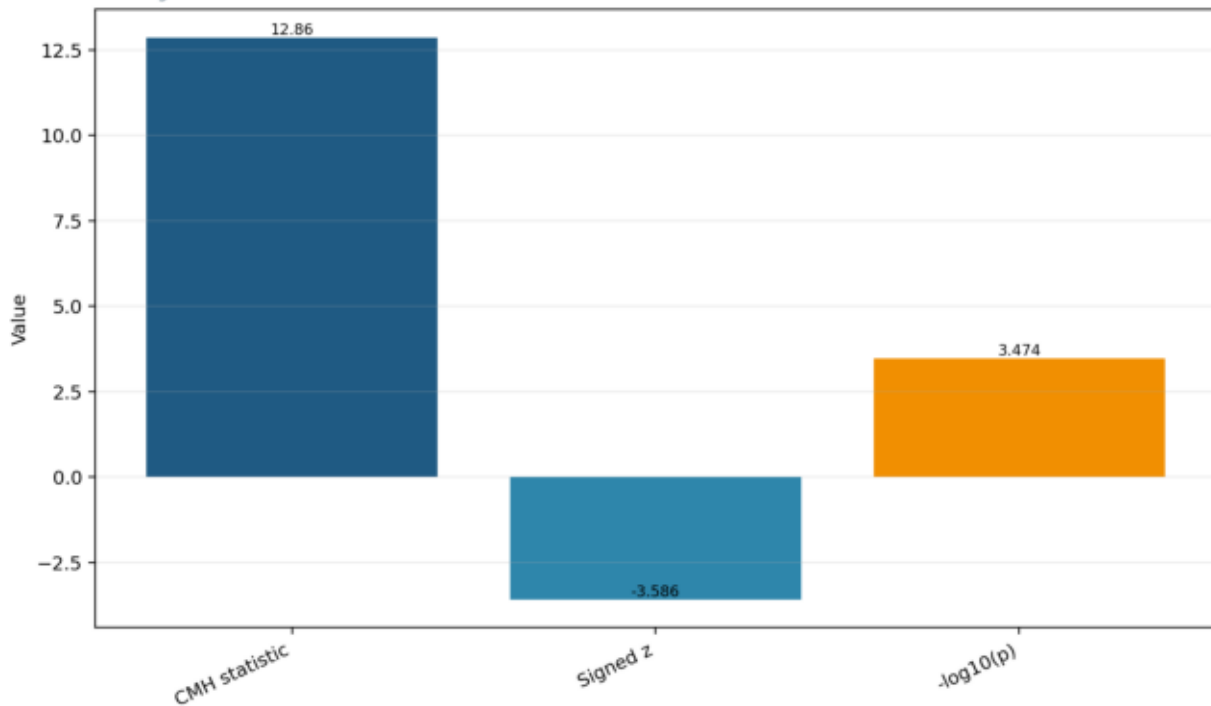
MS ordinal grade table

Sex by ordered G3 category



Ordinal CMH result

One-degree-of-freedom row-mean-scores test



Observed Gp

Low (<10)	Medium (10-13)	High (14-16)	Very high (17+)
9	137	68	23
23	108	44	11

Observed Ms

Low (<10)	Medium (10-13)	High (14-16)	Very high (17+)
41	67	28	10
27	43	8	2

Stratum Score Components

n	observed_male_score	expected_male_score	difference	variance
423	415	437.078	-22.078	56.3582
226	145	157.168	-12.1681	34.8486