

Kendall's Tau-c Ordinal Correlation Analysis

Primary ordinal pair: studytime by G3

N used: 649

Concordant pairs: 79088

Discordant pairs: 43543

Kendall's tau-c: 0.225039

Approximate p-value: 2.51457e-12

Formula: $\tau\text{-c} = [2 \cdot m \cdot (C - D)] / [n^2 \cdot (m - 1)]$

Variable summary:

variable	valid_n	levels	minimum	maximum
age	649	8	15	22
Medu	649	5	0	4
Fedu	649	5	0	4
traveltime	649	4	1	4
studytime	649	4	1	4
failures	649	4	0	3
famrel	649	5	1	5
freetime	649	5	1	5
goout	649	5	1	5
Dalc	649	5	1	5
Walc	649	5	1	5
health	649	5	1	5
absences	649	24	0	32
G1	649	17	0	19
G2	649	16	0	19
G3	649	17	0	19

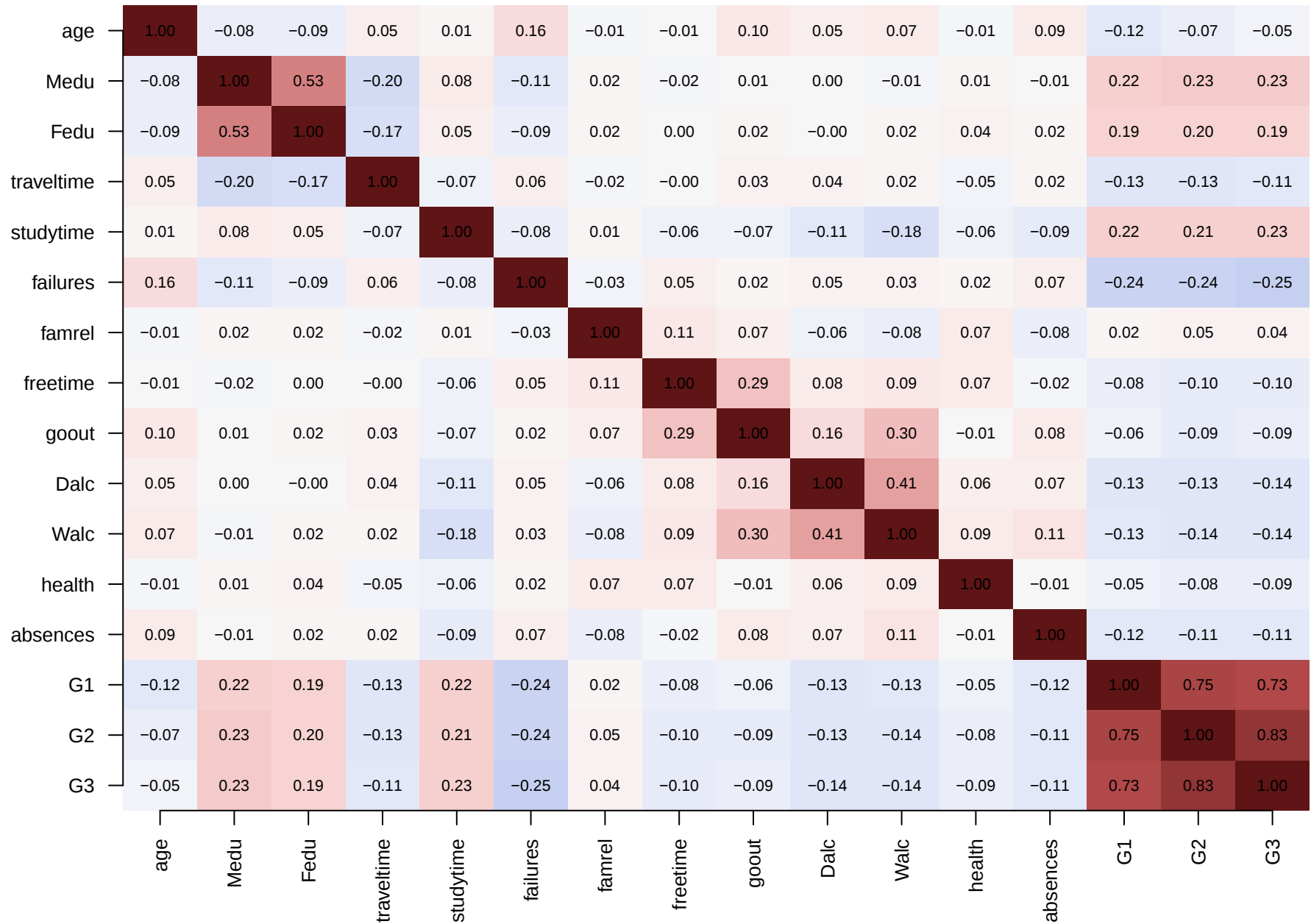
Top pairwise tau-c results:

variable_1	variable_2	n	row_levels	column_levels	m_min_levels	concordant_pairs	discordant_pairs	kendalls_tau_c
G2	G3	649	16	17	16	169536	5460	0.8310256
G1	G2	649	17	16	16	159879	12549	0.7462091
G1	G3	649	17	17	17	158466	13791	0.7298994
Medu	Fedu	649	5	5	5	107233	17491	0.5326554
Dalc	Walc	649	5	5	5	78377	8691	0.4136149
goout	Walc	649	5	5	5	86114	35927	0.2978803
freetime	goout	649	5	5	5	84446	36422	0.2850421
failures	G3	649	4	17	4	6573	45952	-0.2493125
failures	G2	649	4	16	4	7163	45389	-0.2420127
failures	G1	649	4	17	4	7368	45395	-0.2407528
Medu	G2	649	5	16	5	90336	51764	0.2289406
Medu	G3	649	5	17	5	90343	51861	0.2284064

approx_p_value	kendall_rank_test	direction	strength	decision_alpha_0_05
2.113285e-199	Positive	Very strong	Significant	ordinal association
4.403489e-161	Positive	Very strong	Significant	ordinal association
2.108694e-155	Positive	Very strong	Significant	ordinal association
5.622318e-68	Positive	Strong	Significant	ordinal association
4.096093e-59	Positive	Moderate	Significant	ordinal association
1.732229e-22	Positive	Weak	Significant	ordinal association

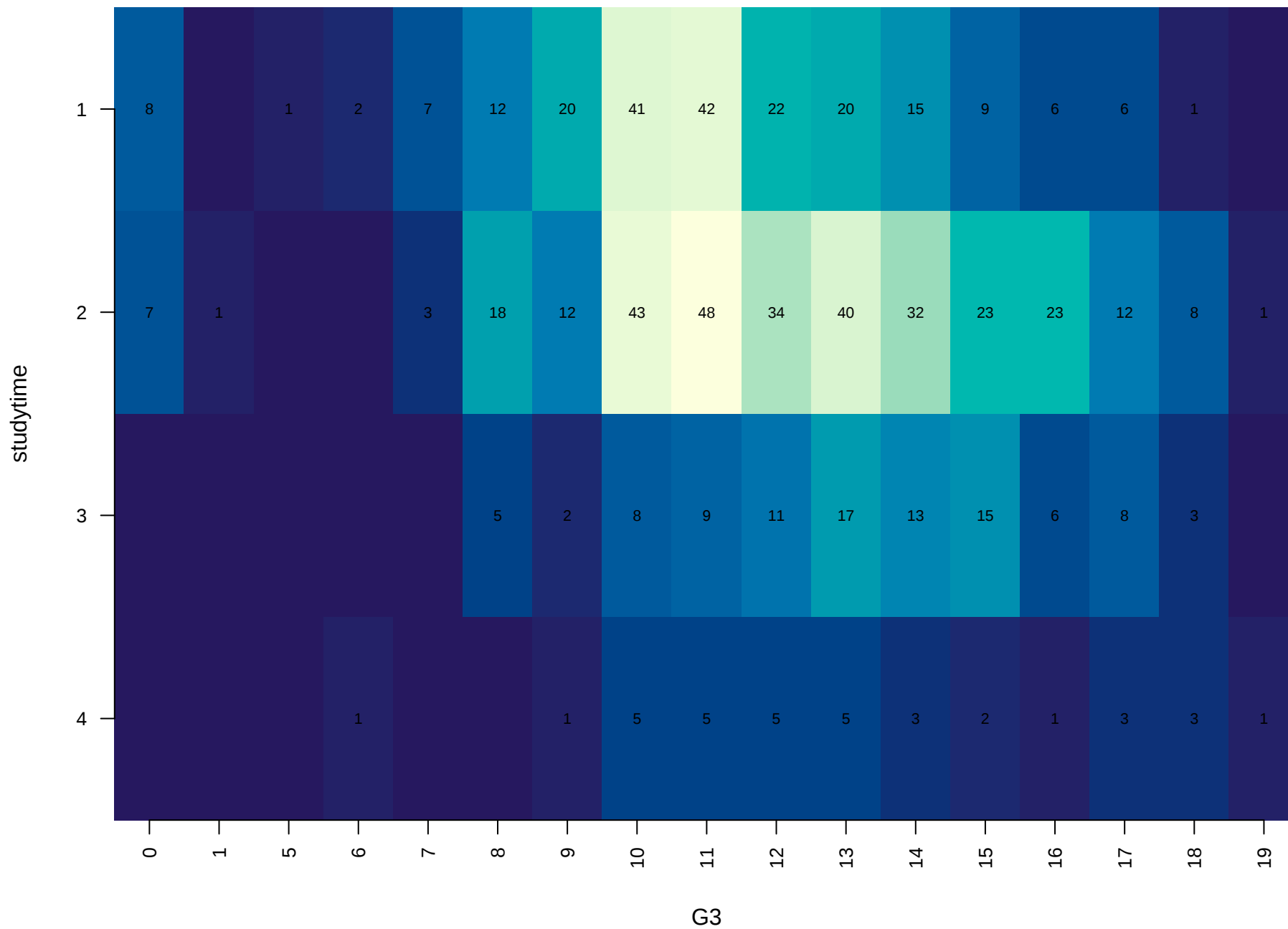
Kendall's Tau-c Correlation Heatmap

Positive values rise together; negative values move in opposite ordinal directions.



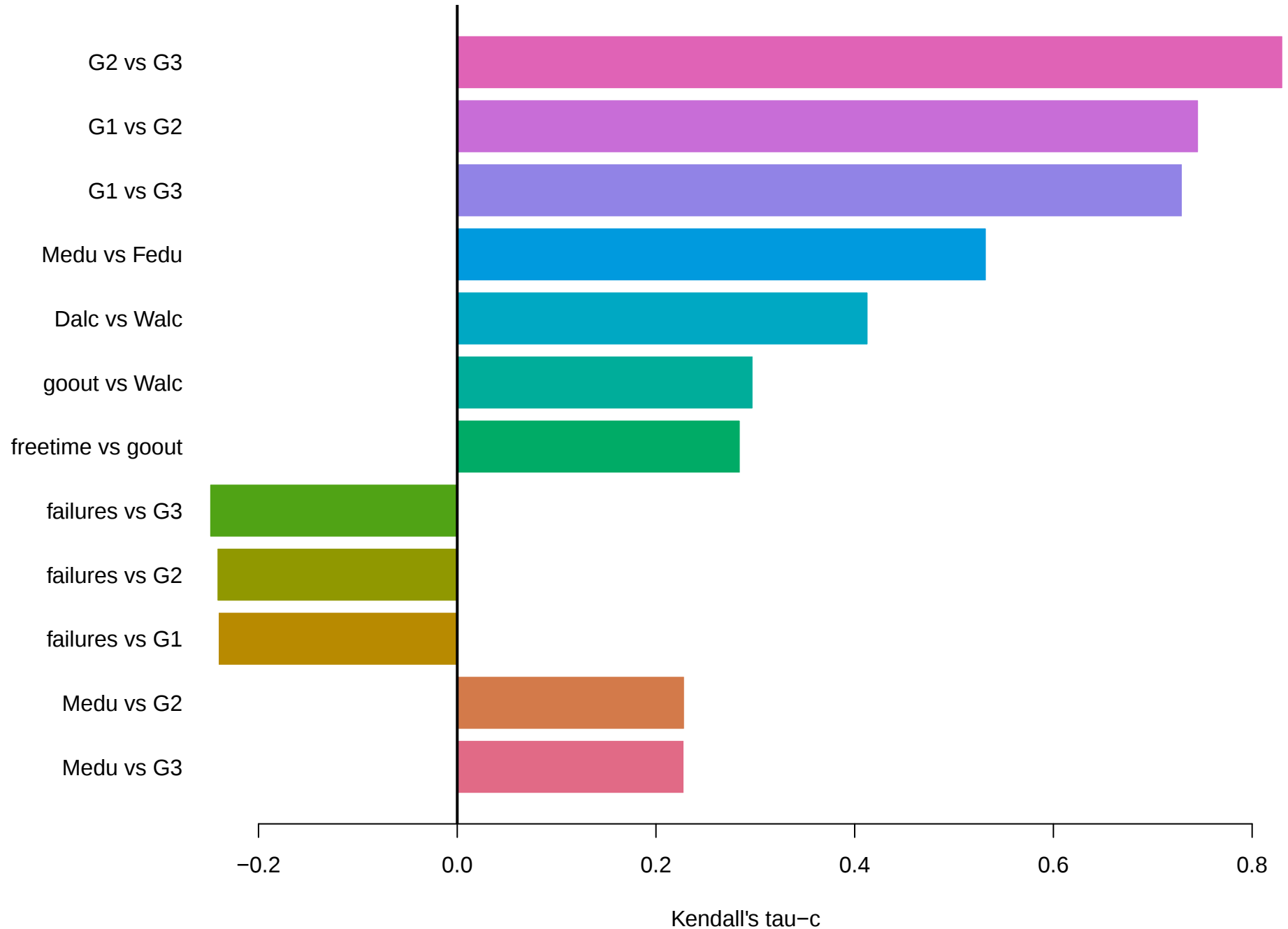
Primary Kendall's Tau-c Contingency Heatmap

Cell counts for studytime by G3



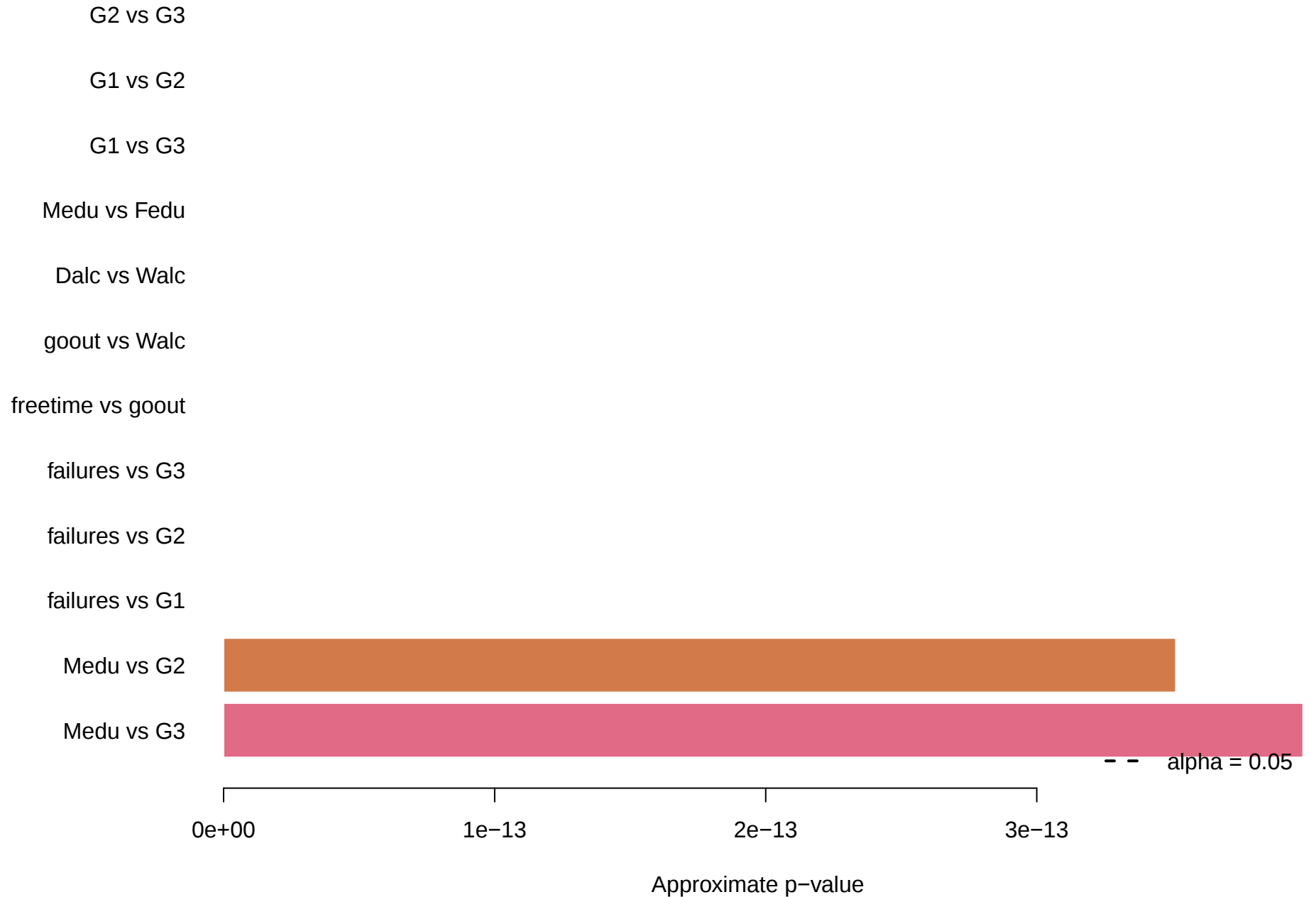
Strongest Kendall's Tau-c Relationships

Pairs are ranked by absolute ordinal association.



Kendall's Tau-c Significance Context

P-values are Kendall rank-test approximations used for tau-c interpretation.



Ordinal Pattern for Primary Kendall's Tau-c Pair

Small jitter separates overlapping points while preserving ordinal levels.

