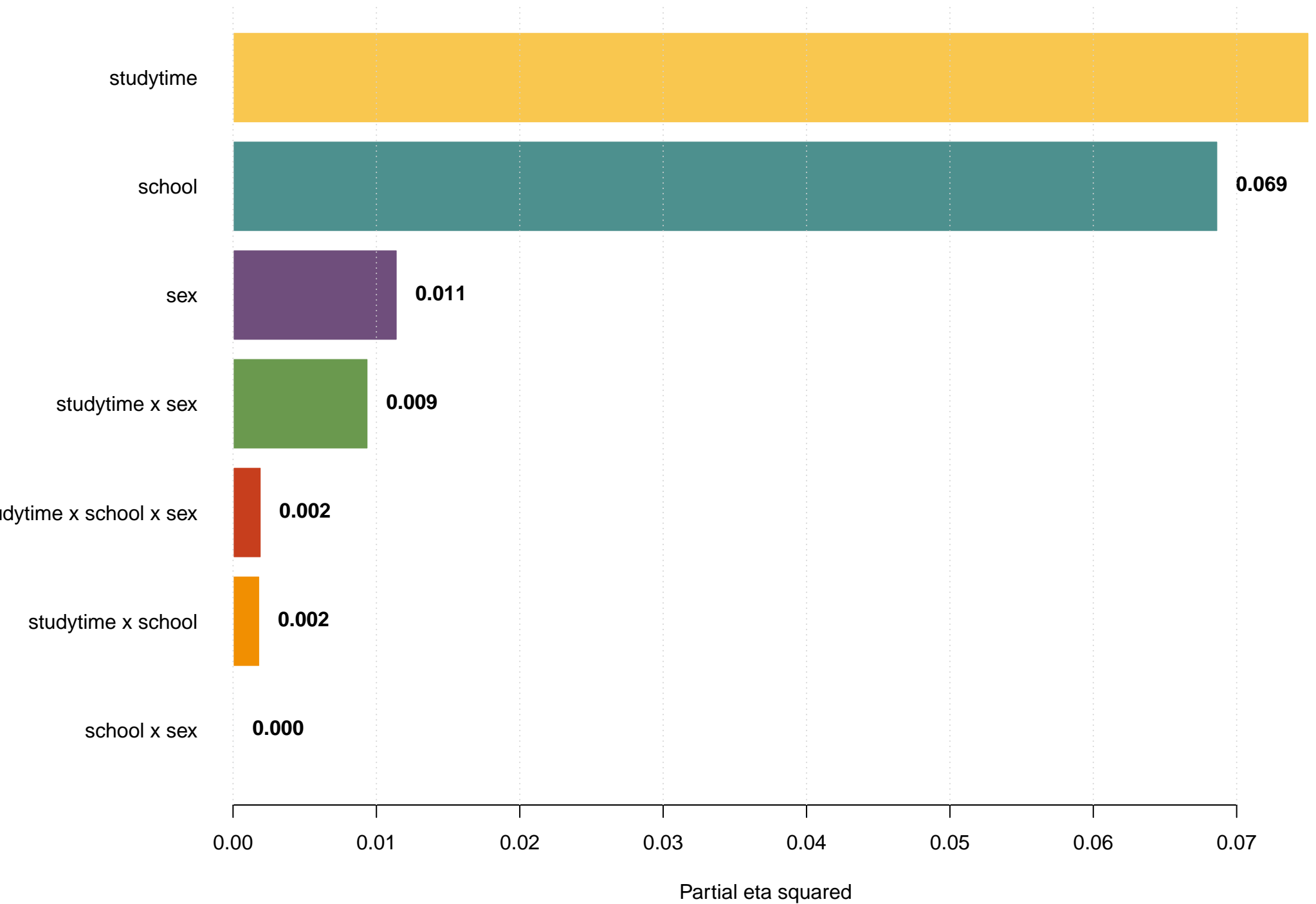


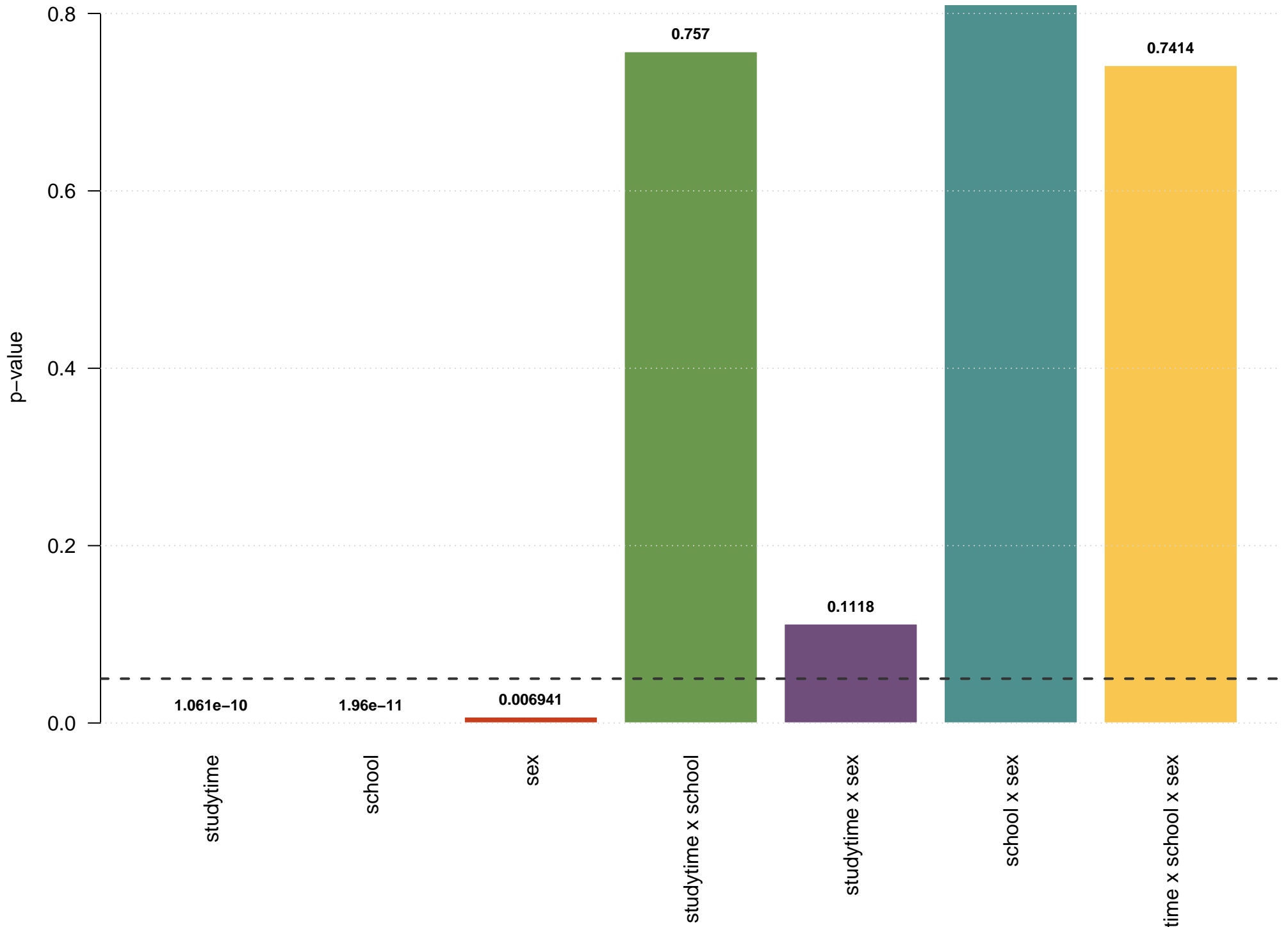
Three Way ANOVA: Effect Sizes

Partial eta squared compares the strength of main effects and interactions.



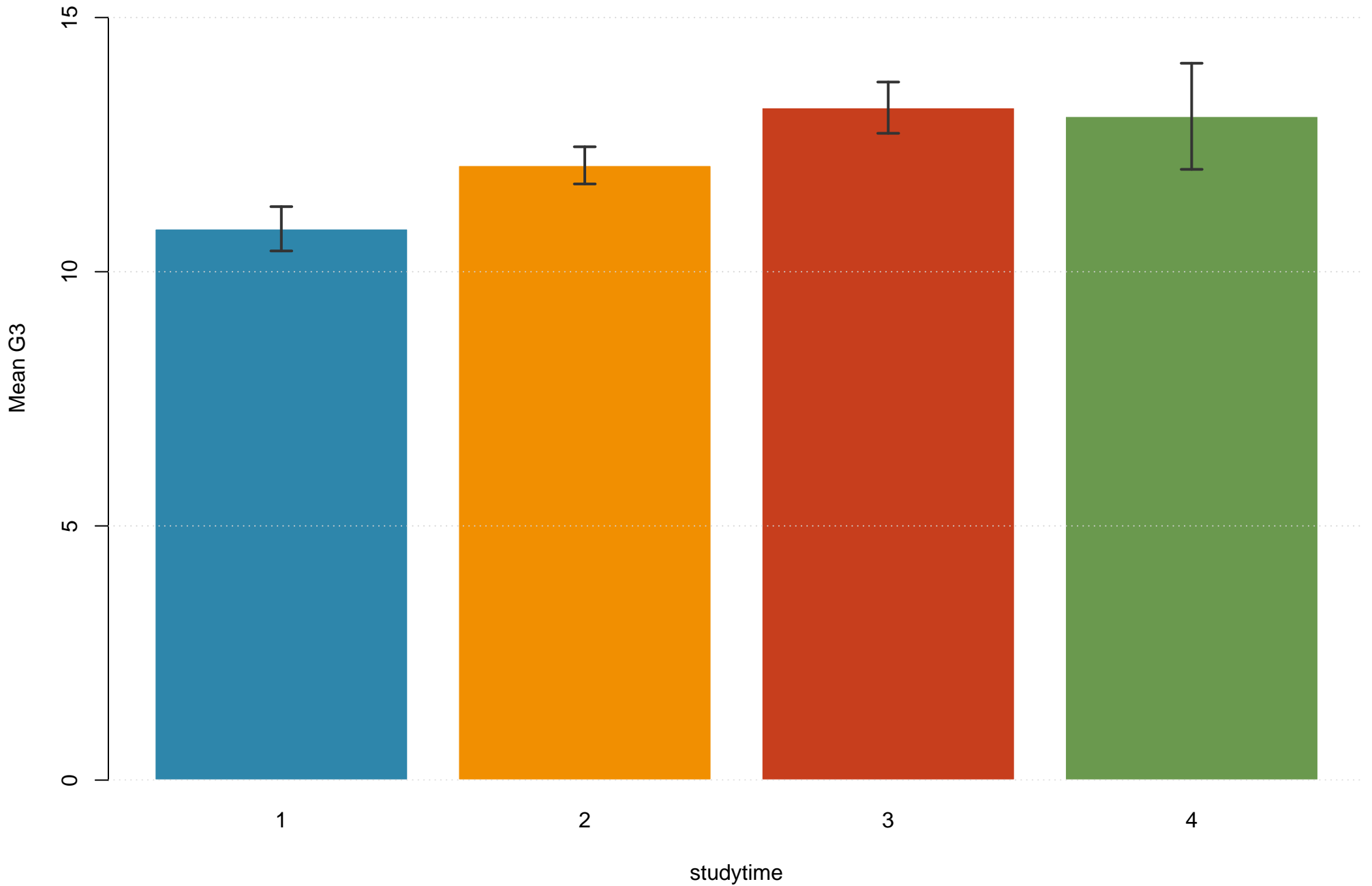
Three Way ANOVA: p-values by Effect

Effects below alpha = 0.05 are statistically significant.



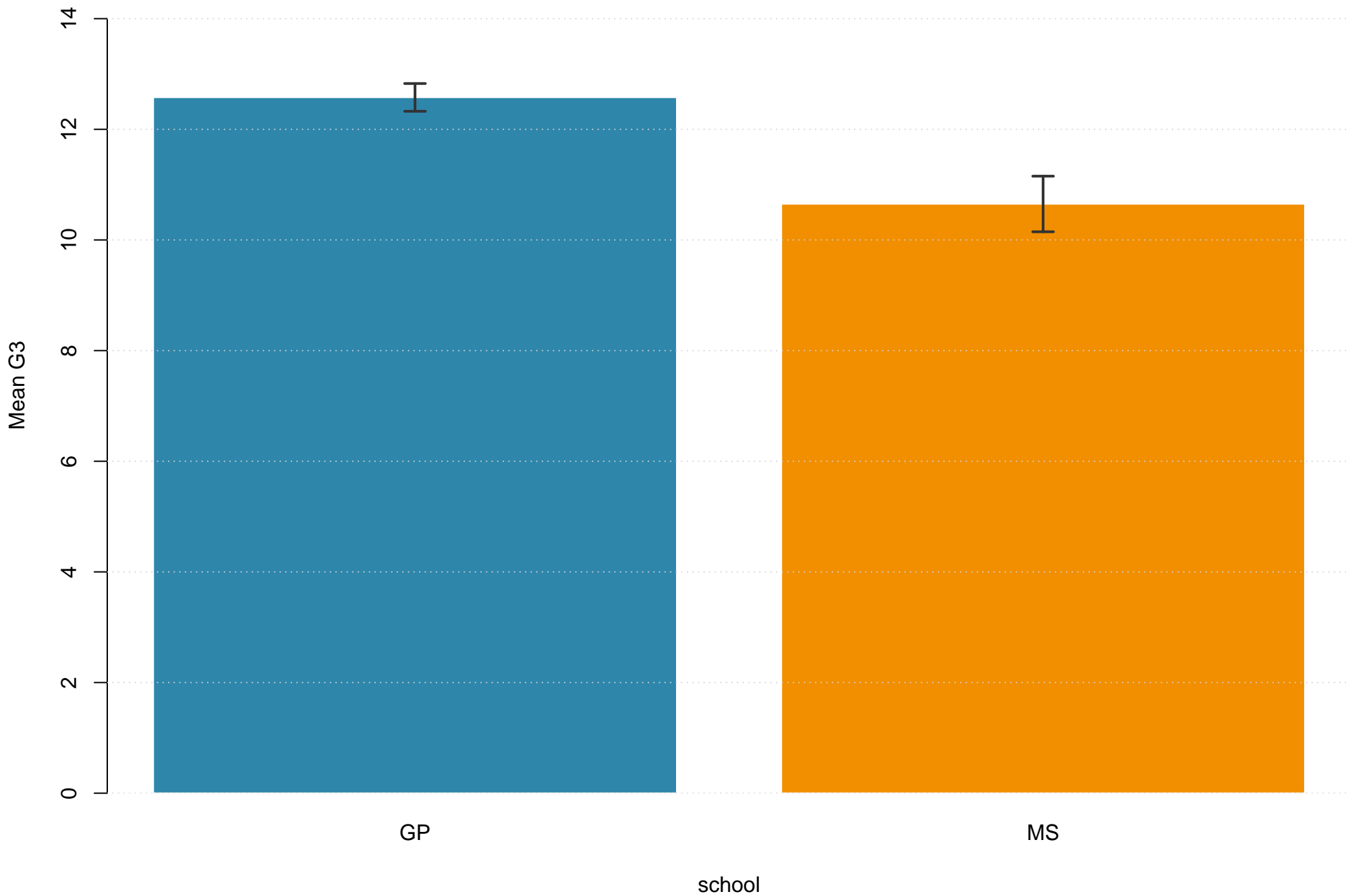
Main Effect Mean Plot: studytime

Bars show group means with 95% confidence intervals.



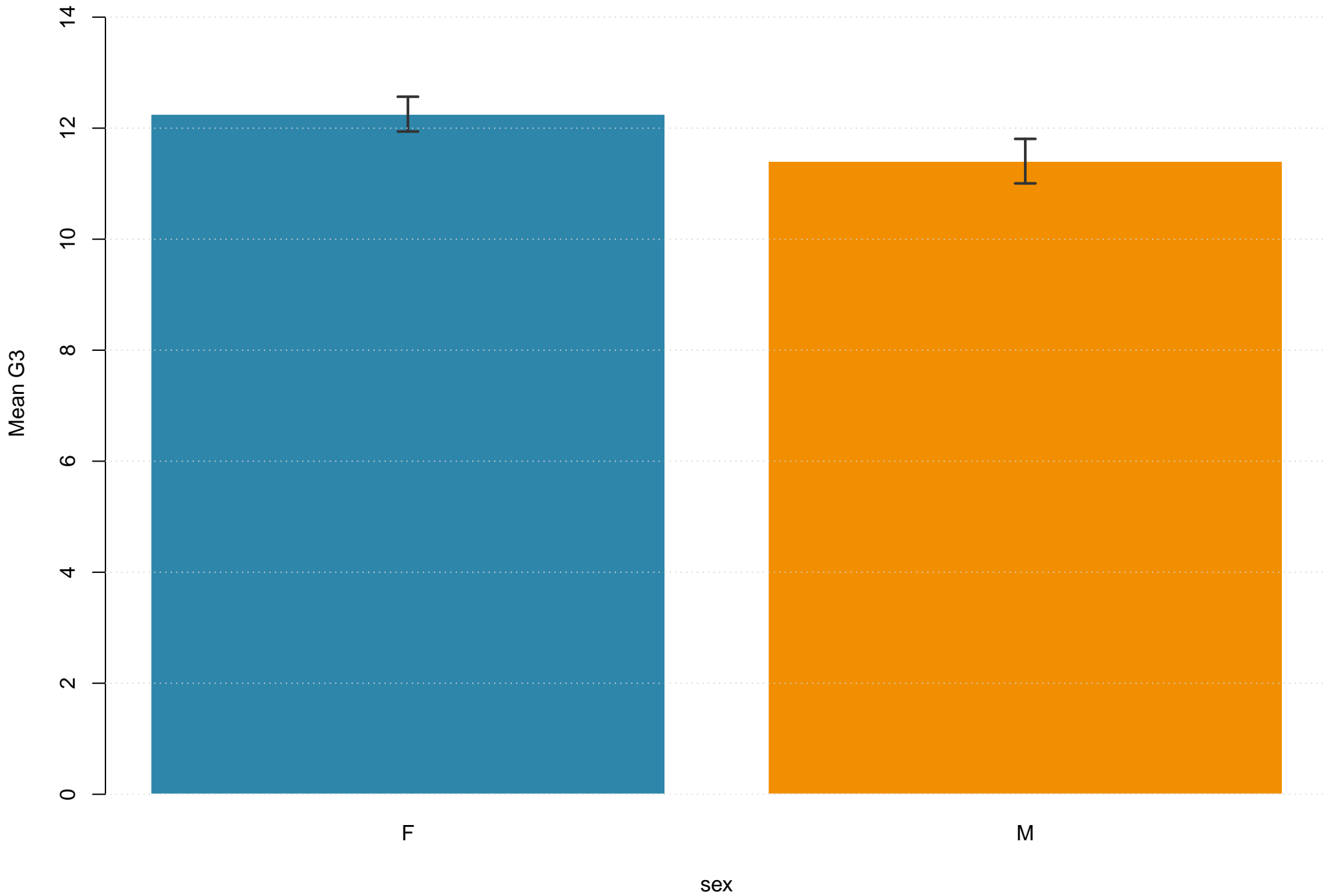
Main Effect Mean Plot: school

Bars show group means with 95% confidence intervals.



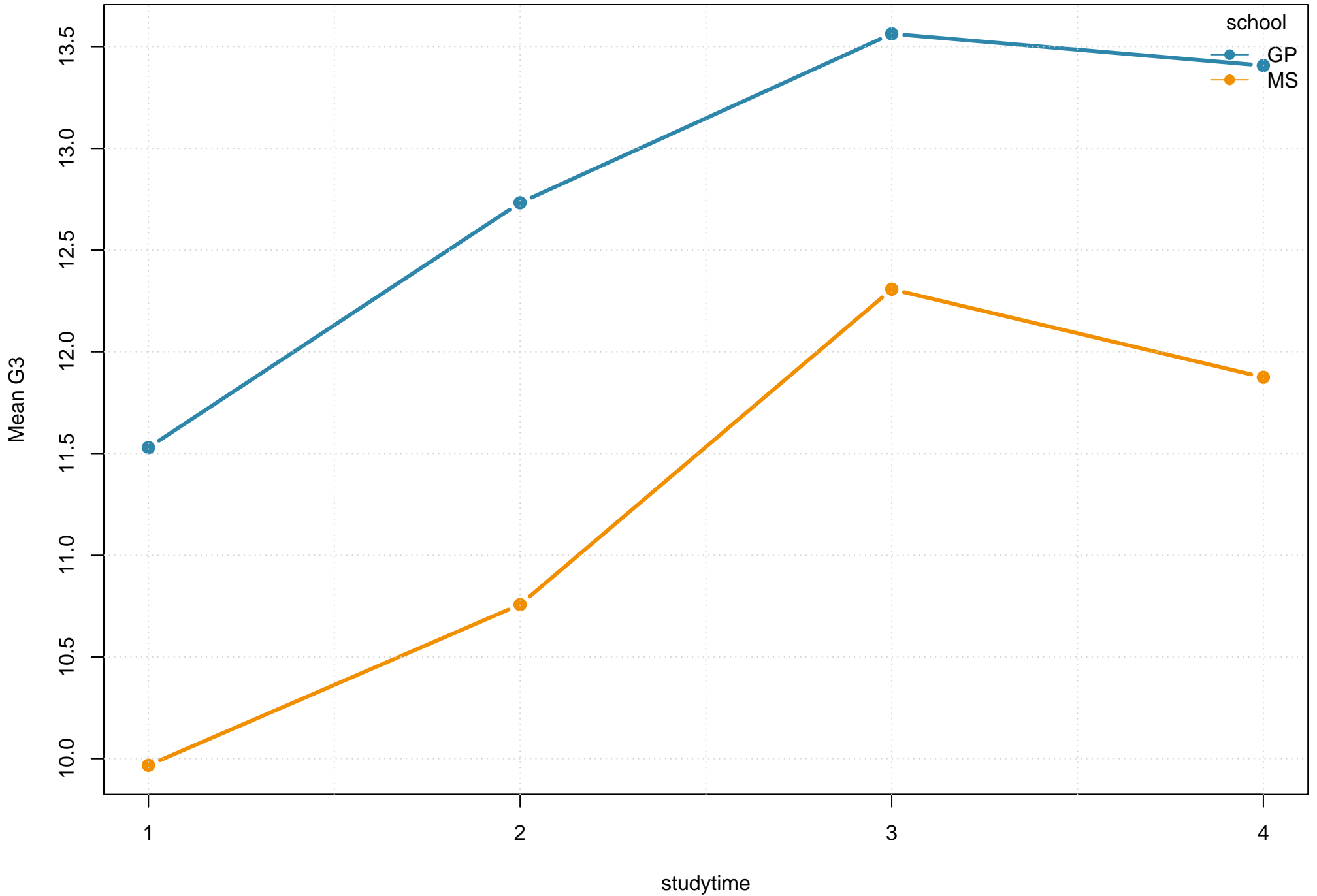
Main Effect Mean Plot: sex

Bars show group means with 95% confidence intervals.



Two-Way Interaction Profile

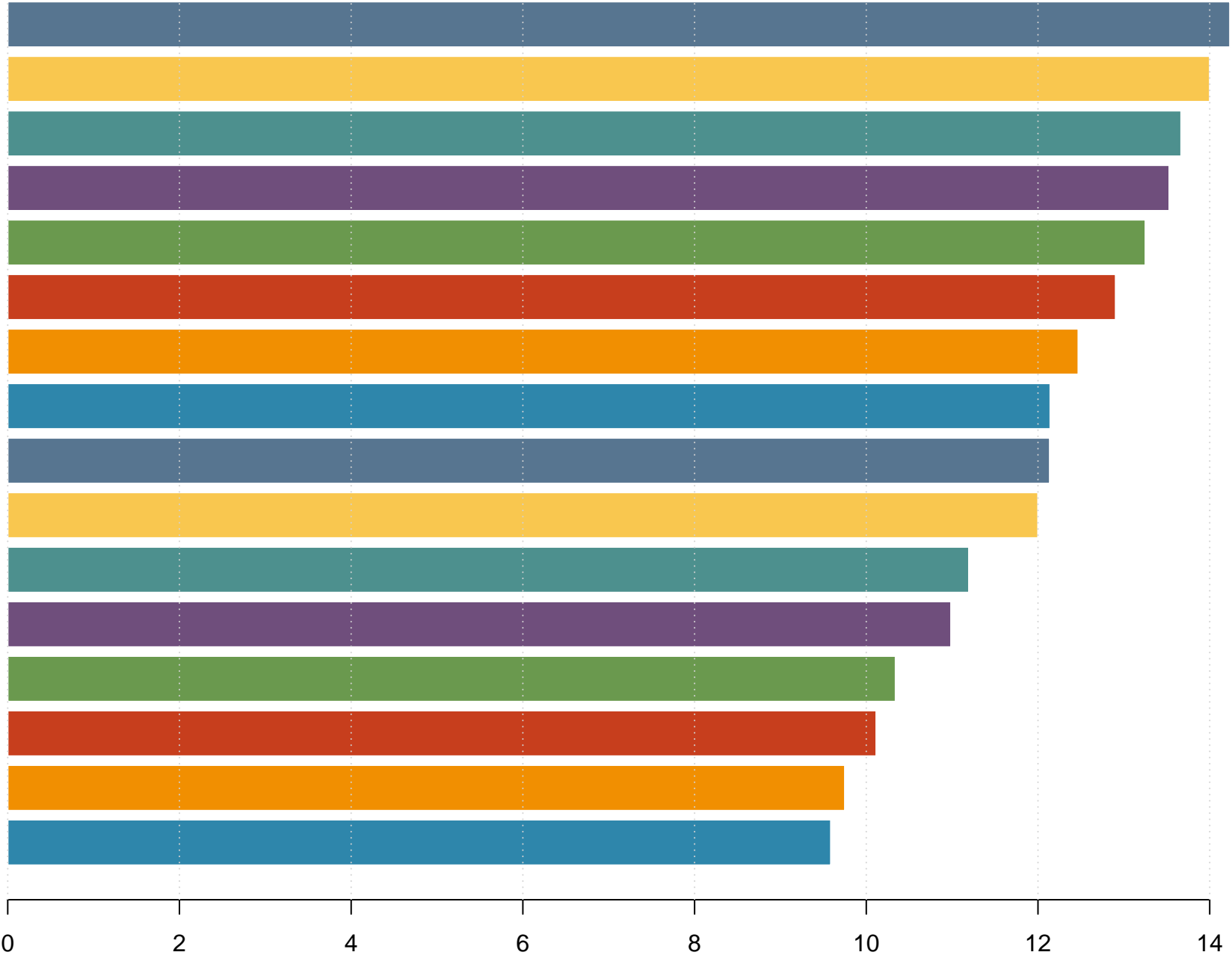
Non-parallel lines suggest interaction between studytime and school .



Three-Way Cell Means

Each bar is one studytime school sex combination.

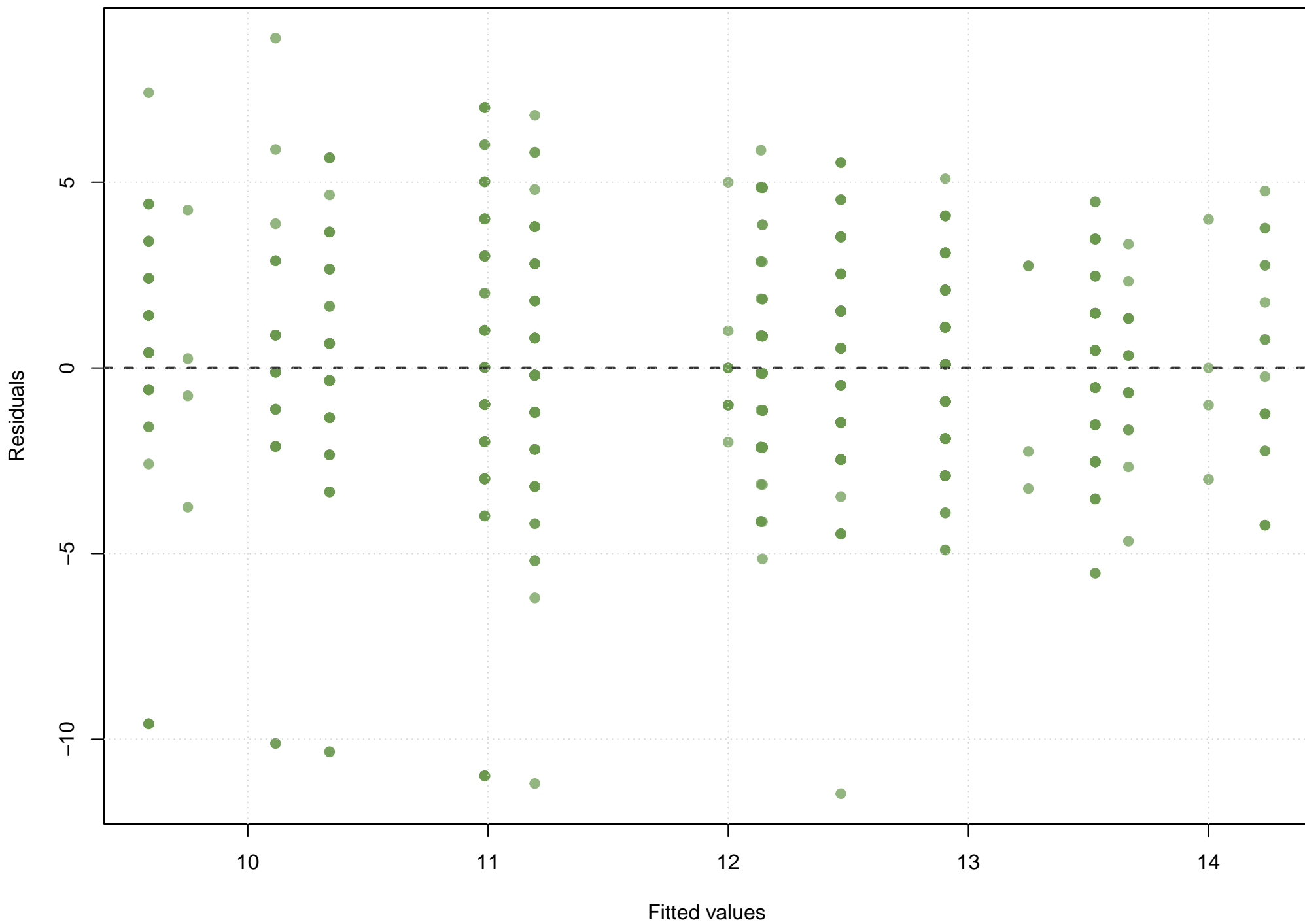
4 | GP | F
4 | MS | F
3 | GP | M
3 | GP | F
3 | MS | M
2 | GP | F
2 | GP | M
1 | GP | F
3 | MS | F
4 | GP | M
1 | GP | M
2 | MS | F
1 | MS | F
2 | MS | M
4 | MS | M
1 | MS | M



Mean G3

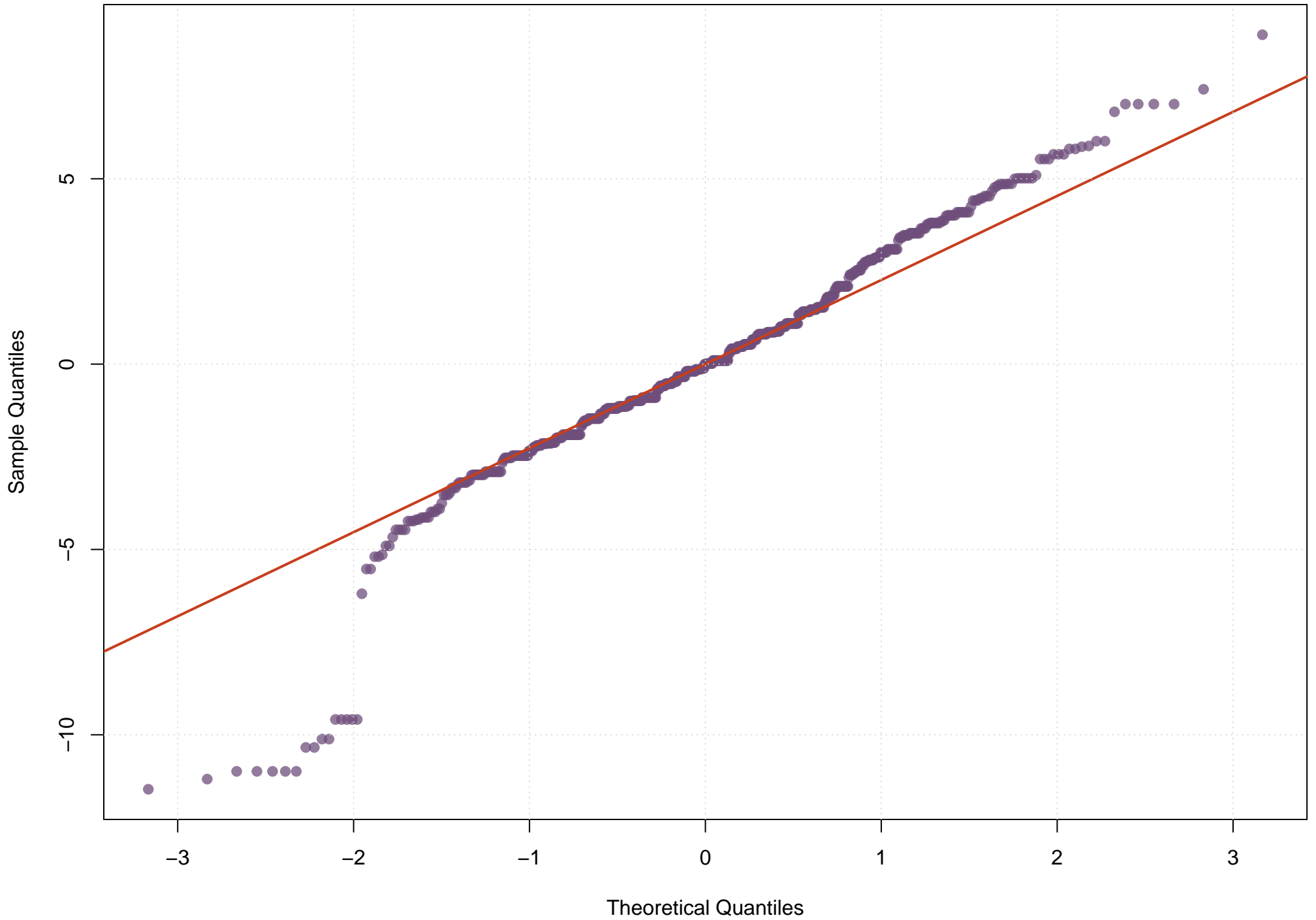
Three Way ANOVA: Residuals vs Fitted

A random cloud around zero supports model assumptions.



Three Way ANOVA: Residual Q-Q Plot

Points close to the diagonal support approximate residual normality.



Three Way ANOVA Summary Table

Main effects, two-way interactions, and the three-way interaction.

effect	Df	F value	Pr(>F)	partial_eta_squared	effect_size_label	decision_alpha_0_05
studytime	3	17.12	1.061e-10	0.0750	Medium	Reject H0
school	1	46.69	1.96e-11	0.0687	Medium	Reject H0
sex	1	7.336	0.006941	0.0115	Small	Reject H0
studytime x school	3	0.3945	0.757	0.0019	Very small	Fail to reject H0
studytime x sex	3	2.006	0.1118	0.0094	Very small	Fail to reject H0
school x sex	1	0.05777	0.8101	0.0001	Very small	Fail to reject H0
studytime x school x sex	3	0.4162	0.7414	0.0020	Very small	Fail to reject H0