

Type III Sum of Squares ANOVA Report

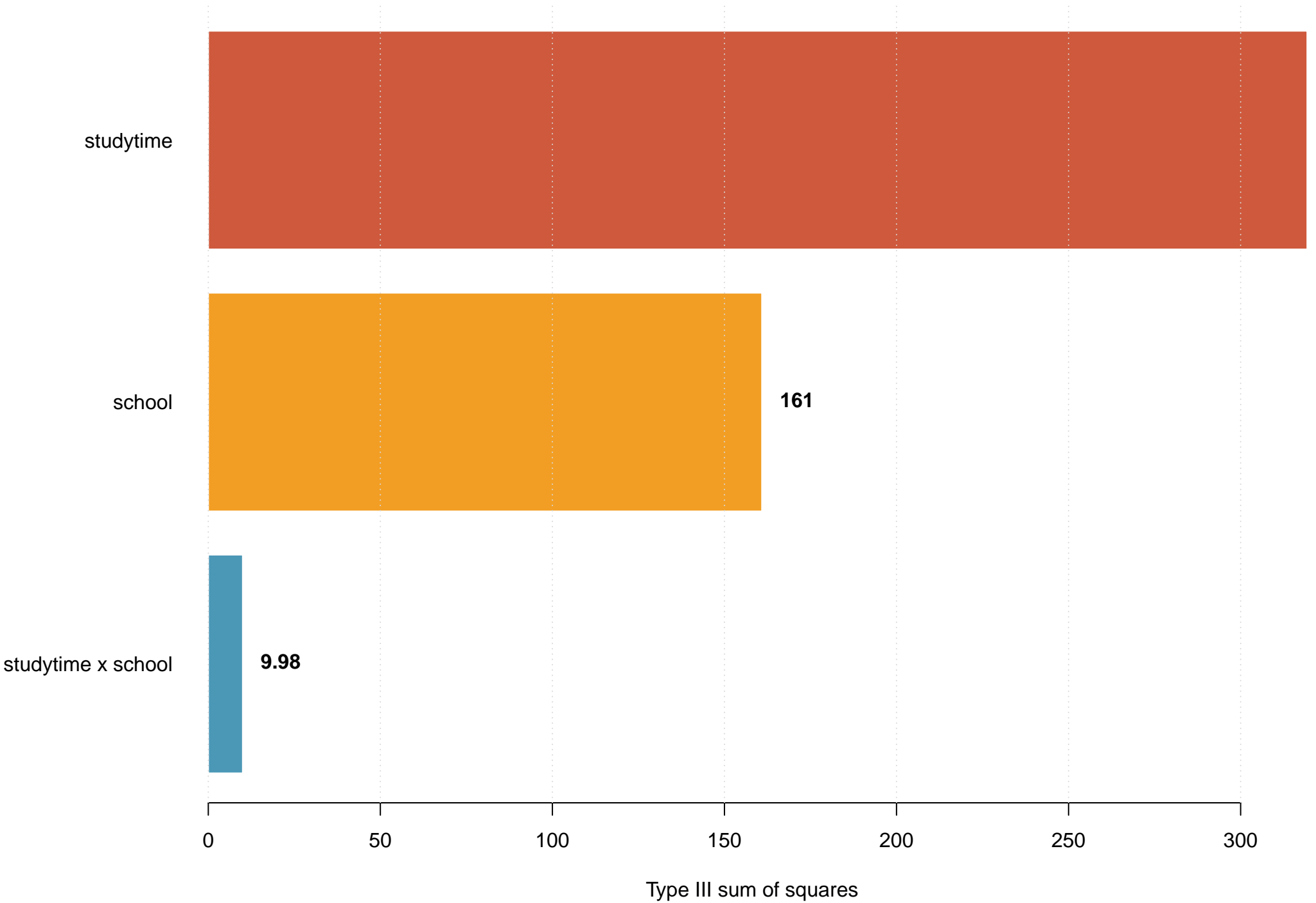
Outcome: G3
Primary factor: studytime
Secondary factor: school
Formula: G3 ~ studytime * school

Type III SS coding: contr.sum
Each effect is tested after adjustment for the other model terms.

Strongest non-intercept effect: studytime
Type III SS: 319.326957
F statistic: 11.632456
p-value: 0.00000020

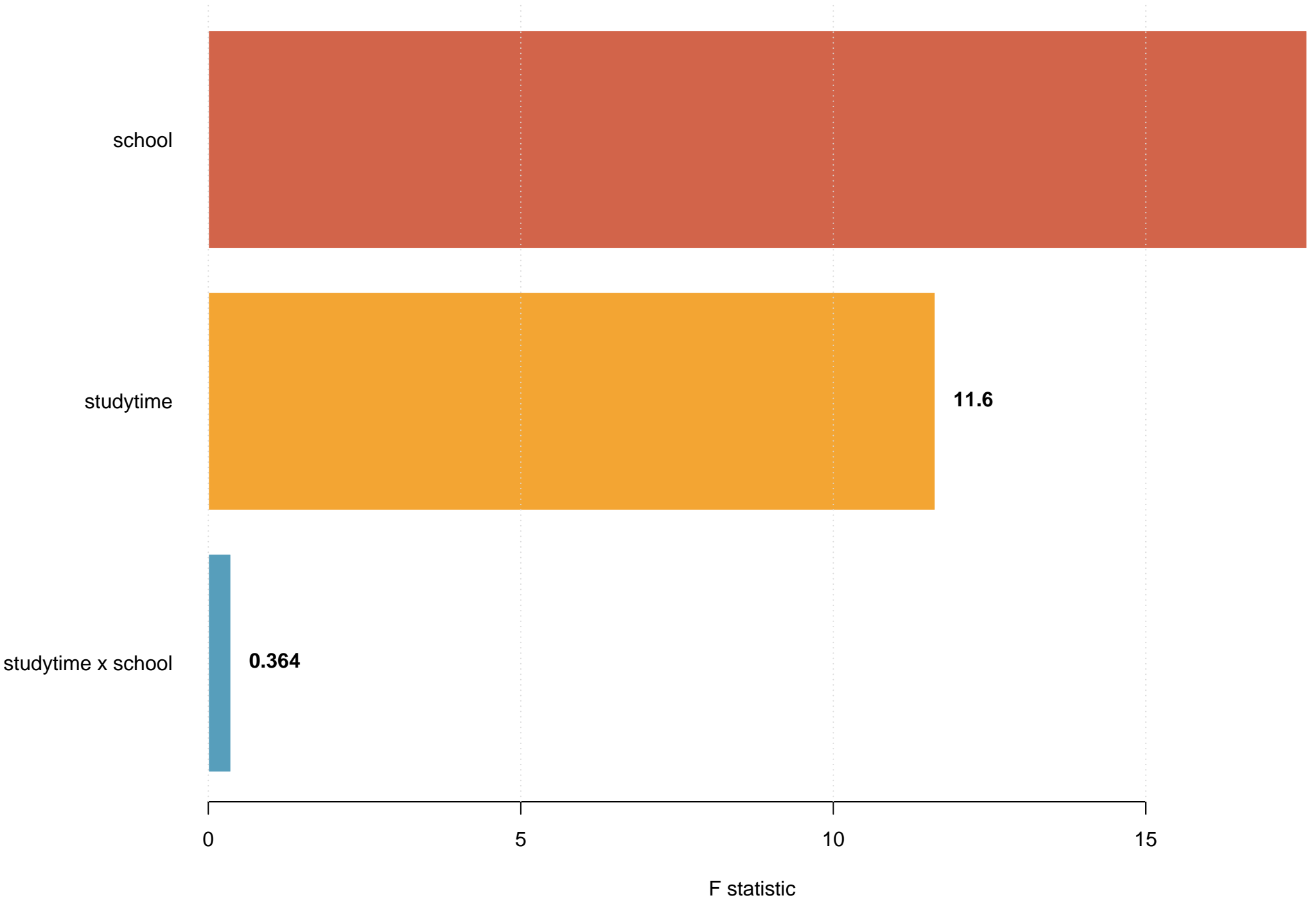
Type III Sum of Squares by Effect

Each effect is tested after adjusting for the other model terms.



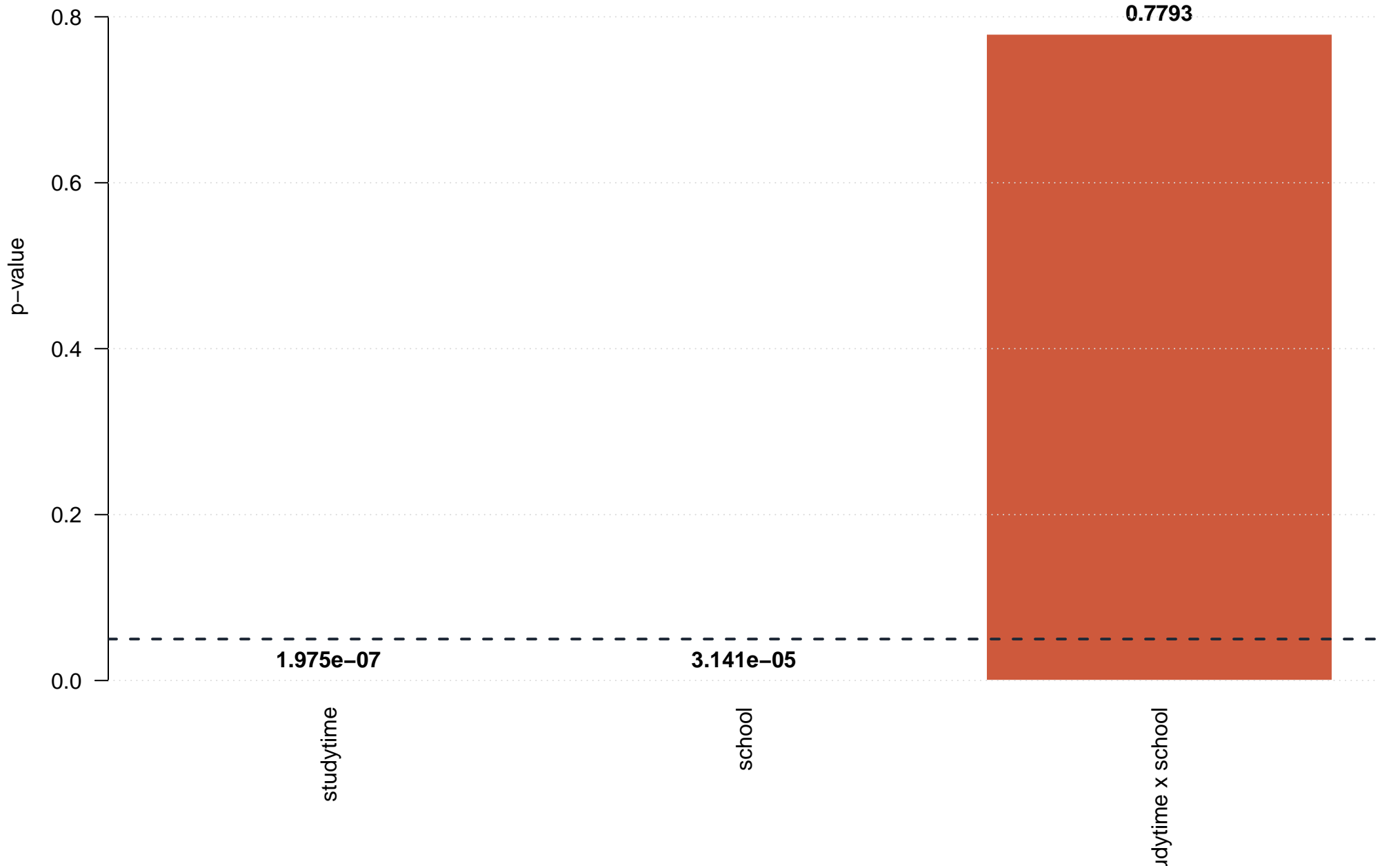
Type III ANOVA F Statistics

Larger F values indicate stronger adjusted evidence against the null effect.



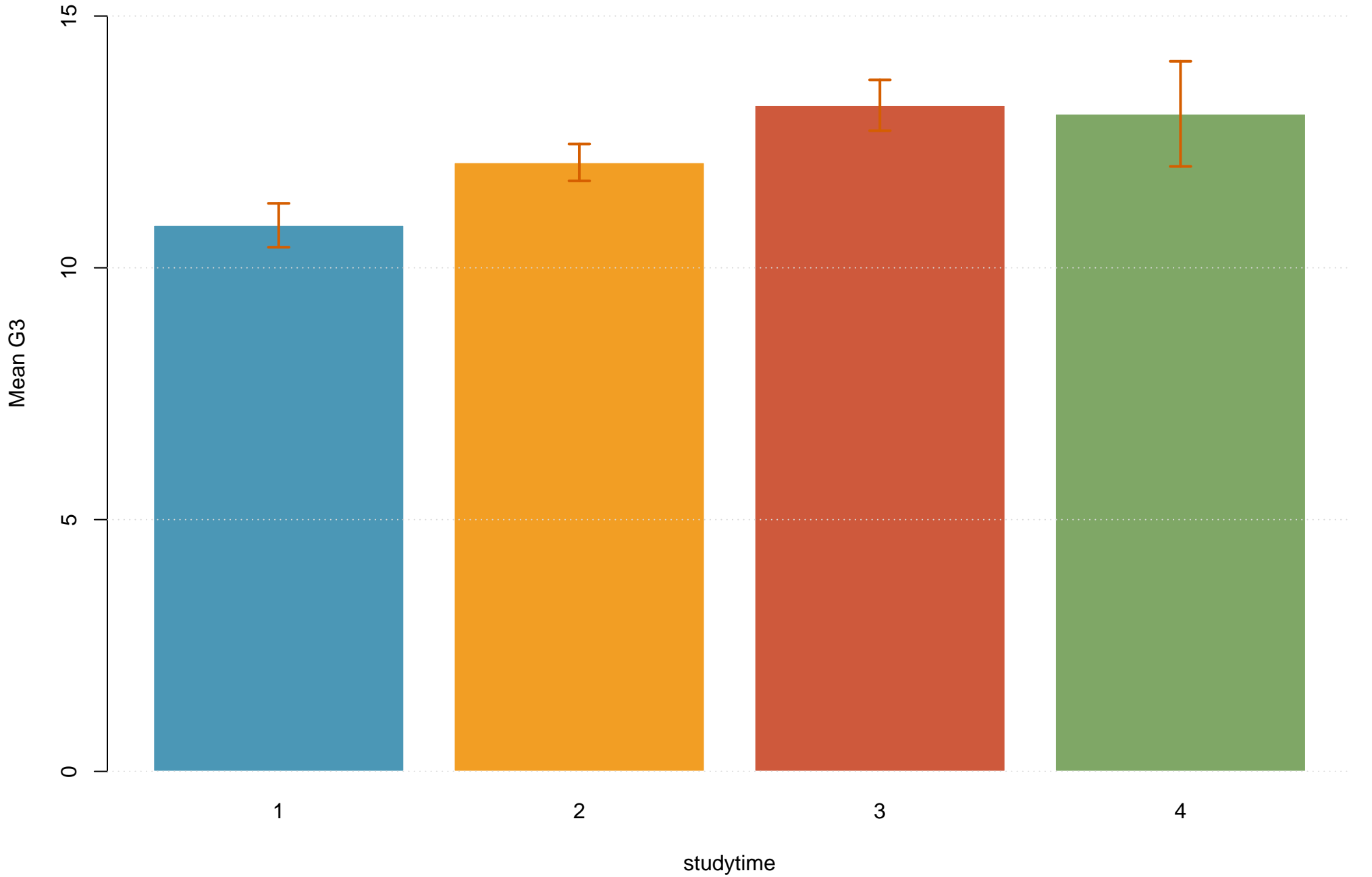
Type III ANOVA p-value Decision Chart

Effects below the alpha line are statistically significant at the 0.05 level.



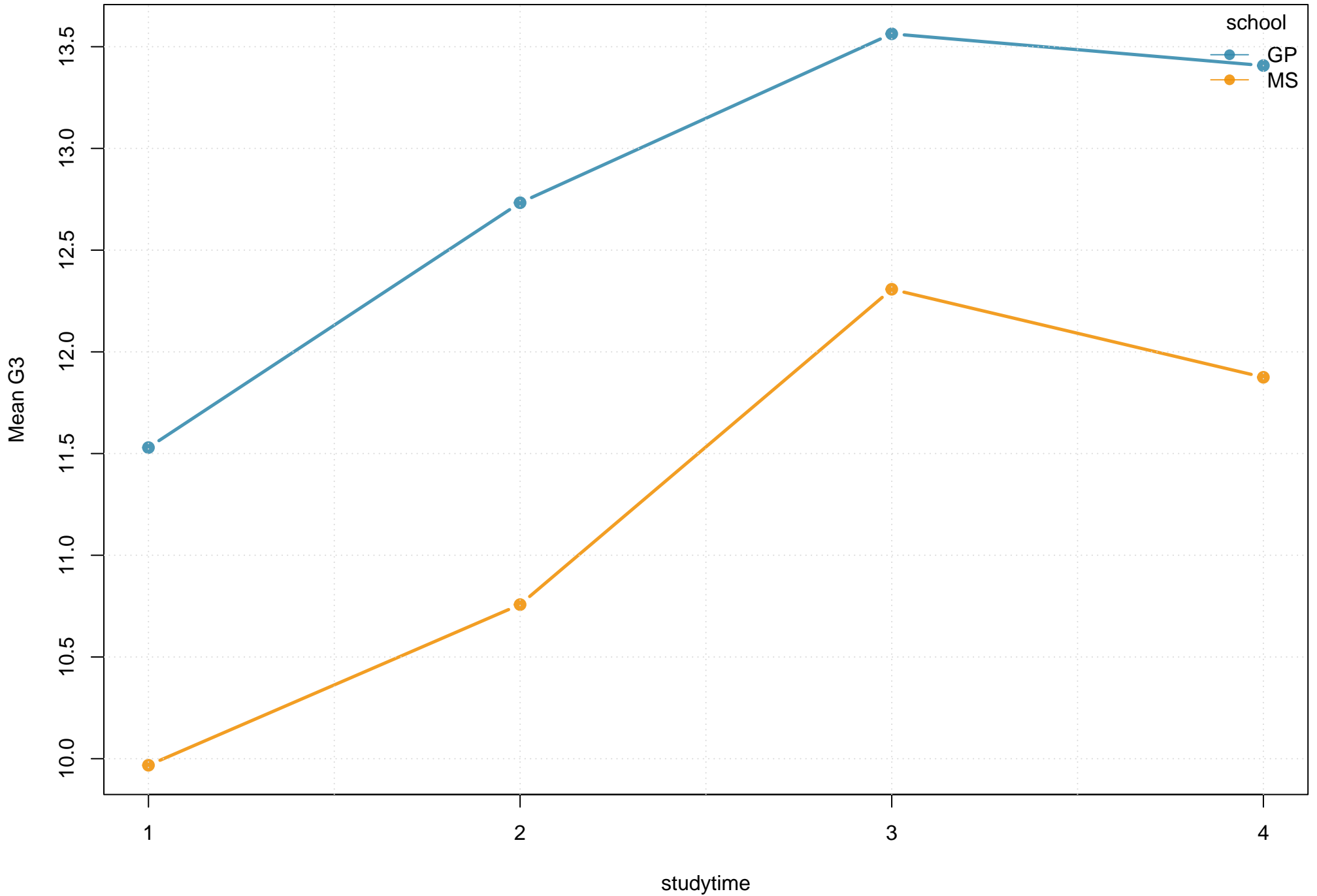
Mean G3 by studytime

Bars show group means with 95% confidence intervals.



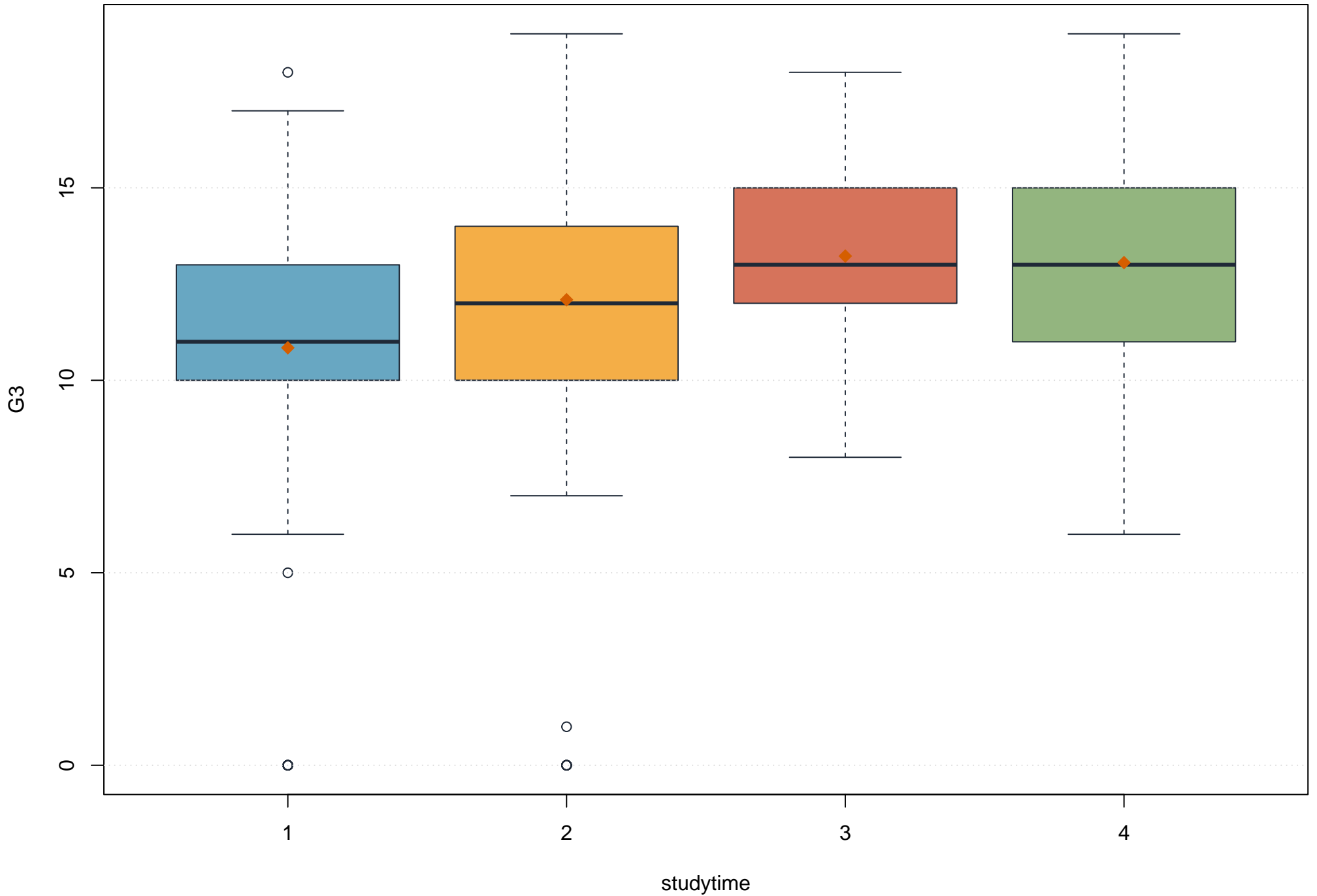
Adjusted Model Context: Mean Profile

Non-parallel lines suggest interaction between studytime and school .



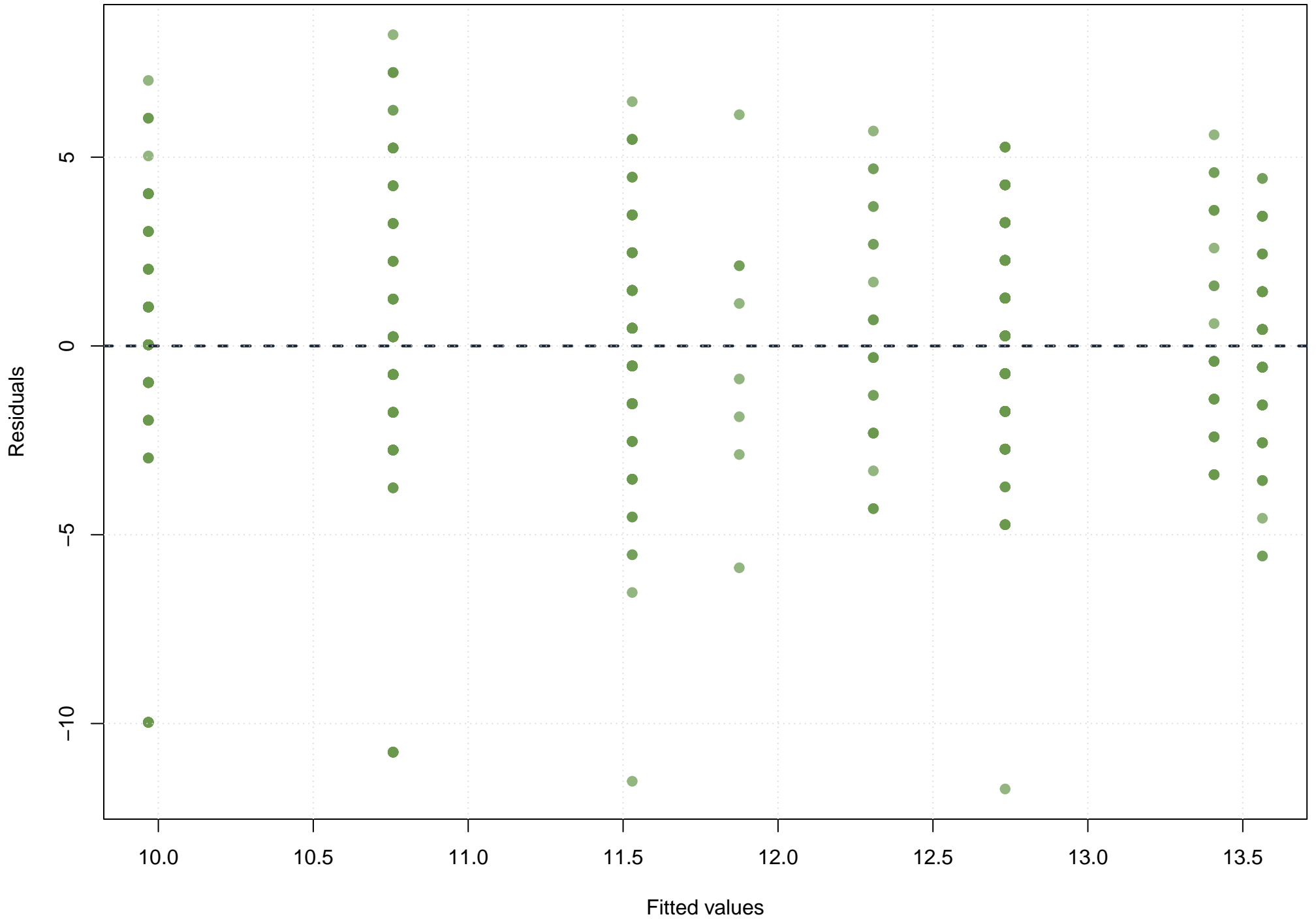
Distribution of G3 by studytime

Boxplots show spread, median, mean marker, and possible outliers.



Type III Model: Residuals vs Fitted Values

A random pattern around zero supports ANOVA model interpretation.



Type III Sum of Squares ANOVA Table

Type III tests adjust each effect for the other effects in the model.

effect	df	type_iii_sum_sq	f_statistic	p_value	decision_alpha_0_05
Intercept	1	3.717e+04	4062	1.381e-279	Reject H0
studytime	3	319.3	11.63	1.975e-07	Reject H0
school	1	160.9	17.58	3.141e-05	Reject H0
studytime x school	3	9.982	0.3636	0.7793	Fail to reject H0