

# Factorial ANOVA Report

Default model:  
G3 ~ studytime \* sex

Model summary:

target_variable	factor_1	factor_2	model	total_n	factor_1_levels	factor_2_levels	number_of_cells
G3	studytime	sex	G3 ~ studytime * sex	649	4	2	8
bartlett_statistic	bartlett_p_value	fligner_statistic	fligner_p_value	alpha			
13.5231	0.06034353	5.777516	0.5659548	0.05			

note

Use the ANOVA table to evaluate main effects and interaction.

ANOVA table:

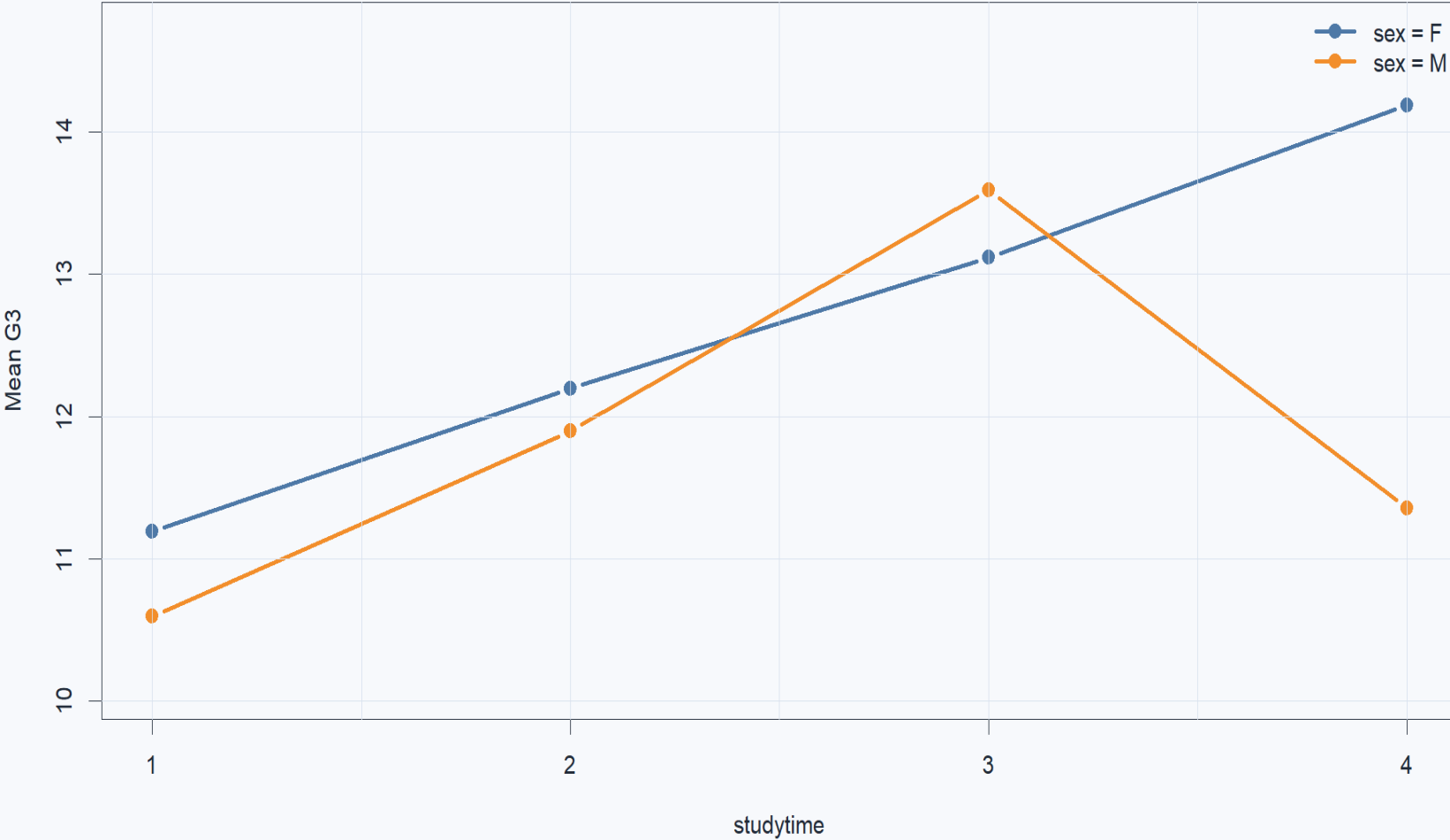
source	Df	Sum Sq	Mean Sq	F value	Pr(>F)	eta_squared	partial_eta_squared
studytime	3	465.07782	155.025942	16.021724	4.698694e-10	0.068765266	NA
sex	1	31.06775	31.067749	3.210810	7.362479e-02	0.004593601	NA
studytime:sex	3	64.81548	21.605160	2.232865	8.322970e-02	0.009583458	NA
Residuals	641	6202.30551	9.675984	NA	NA	0.917057675	NA

Cell summary:

studytime	sex	n	mean	median	standard_deviation	variance	minimum	maximum
1	F	89	11.19101	11	2.969069	8.815373	0	17
2	F	198	12.19697	12	3.223737	10.392478	0	18
3	F	75	13.12000	13	2.609546	6.809730	8	18
4	F	21	14.19048	14	2.874353	8.261905	10	19
1	M	123	10.59350	11	3.377450	11.407170	0	18
2	M	107	11.89720	11	3.284999	10.791218	0	19
3	M	22	13.59091	14	2.108014	4.443723	9	17
4	M	14	11.35714	11	2.499450	6.247253	6	17

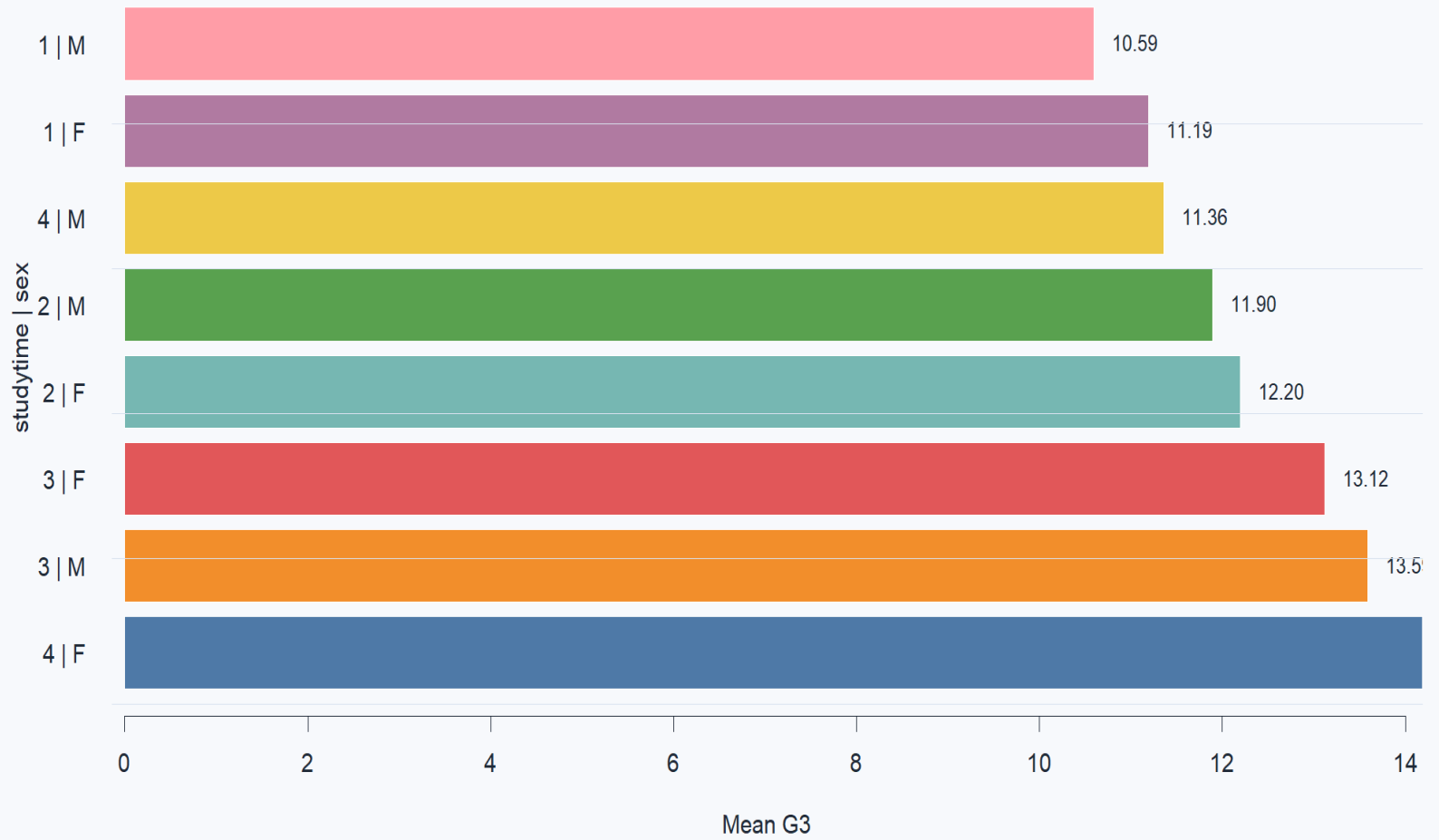
# Factorial ANOVA: Interaction Plot

Non-parallel lines suggest a possible studytime × sex interaction.



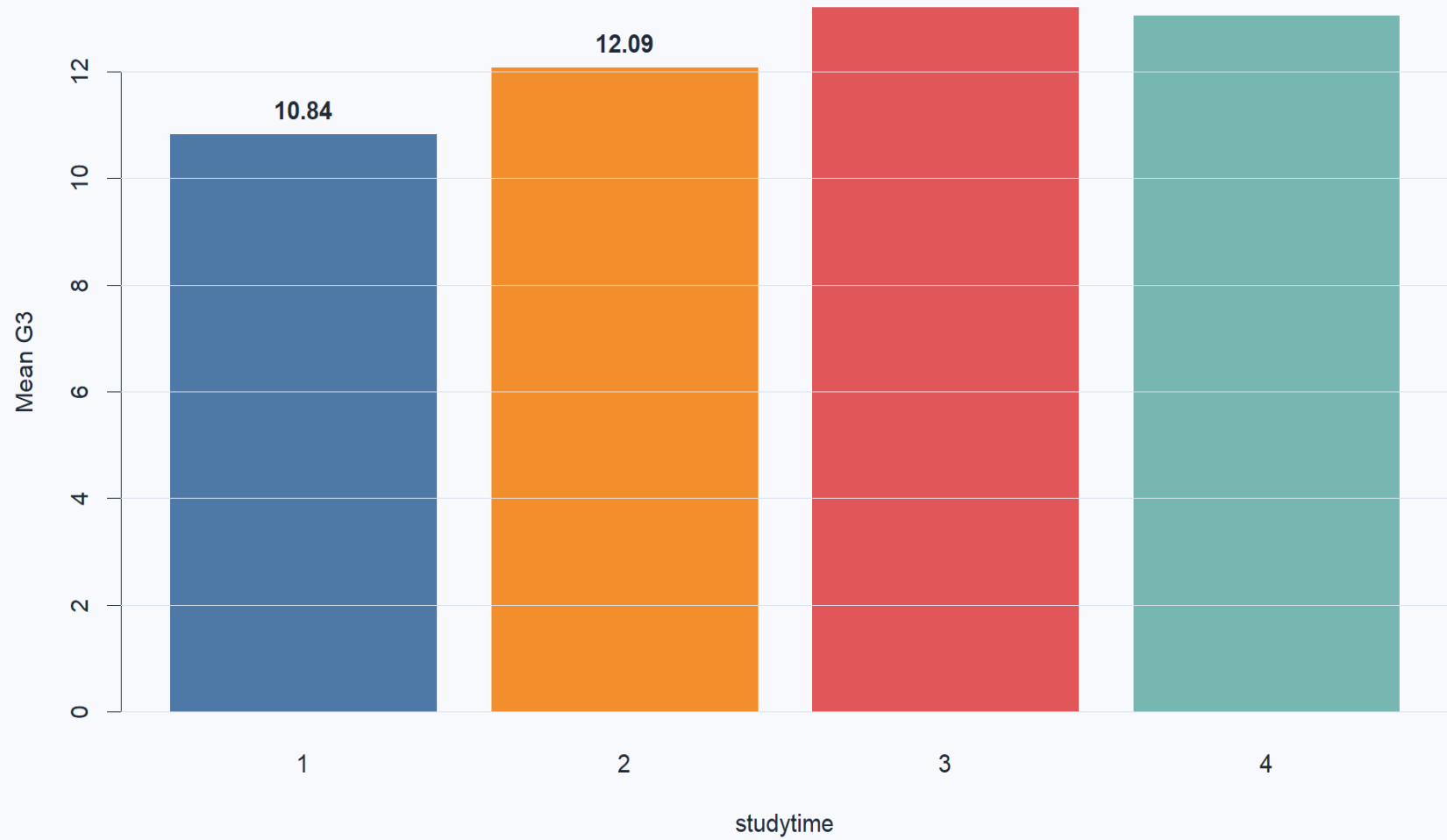
## Factorial ANOVA: Cell Means

Each bar represents the outcome mean for one combination of the two factors.



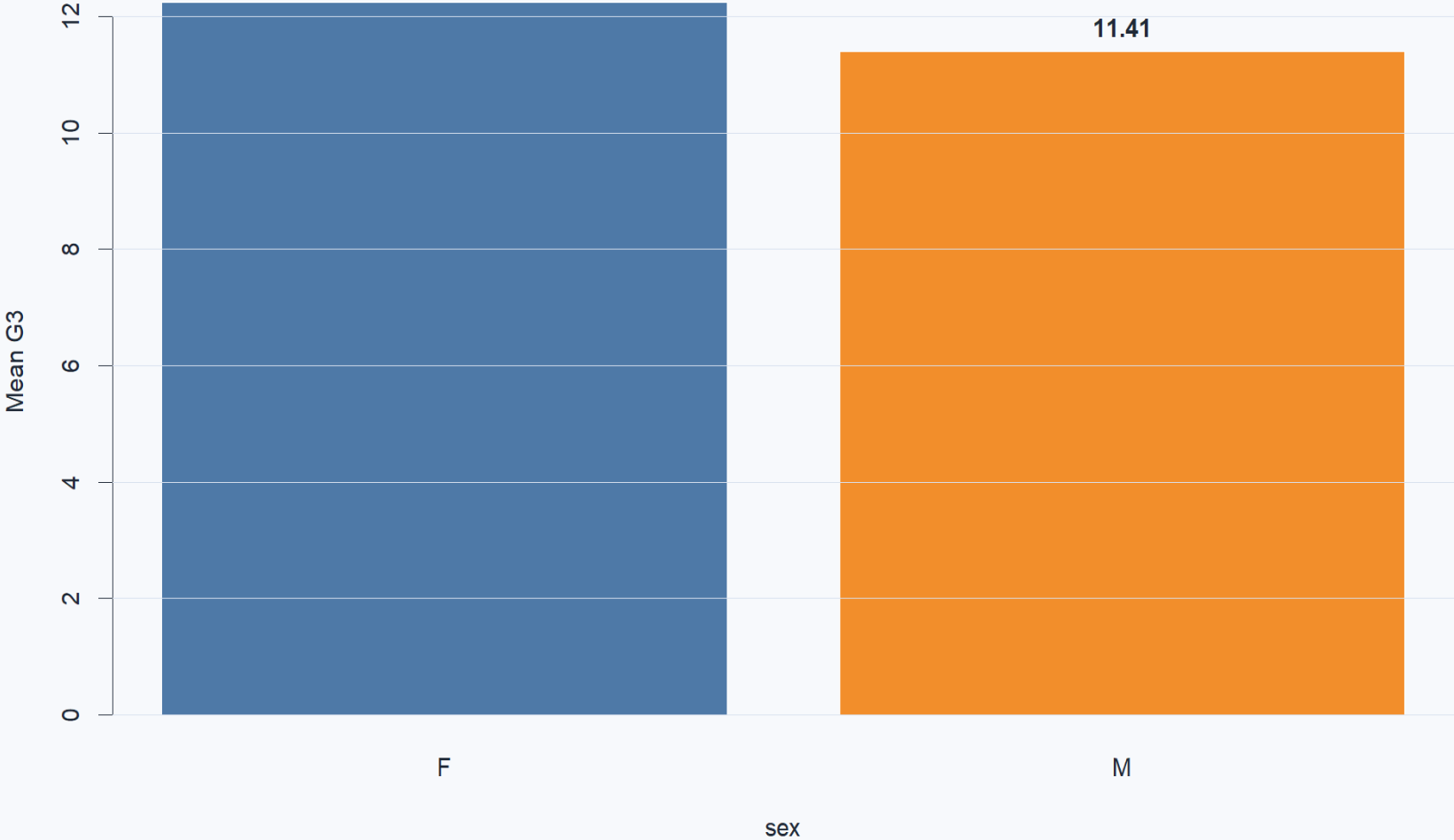
## Factorial ANOVA: Main Effect of studytime

This chart compares overall mean G3 across levels of studytime.



# Factorial ANOVA: Main Effect of sex

This chart compares overall mean G3 across levels of sex.



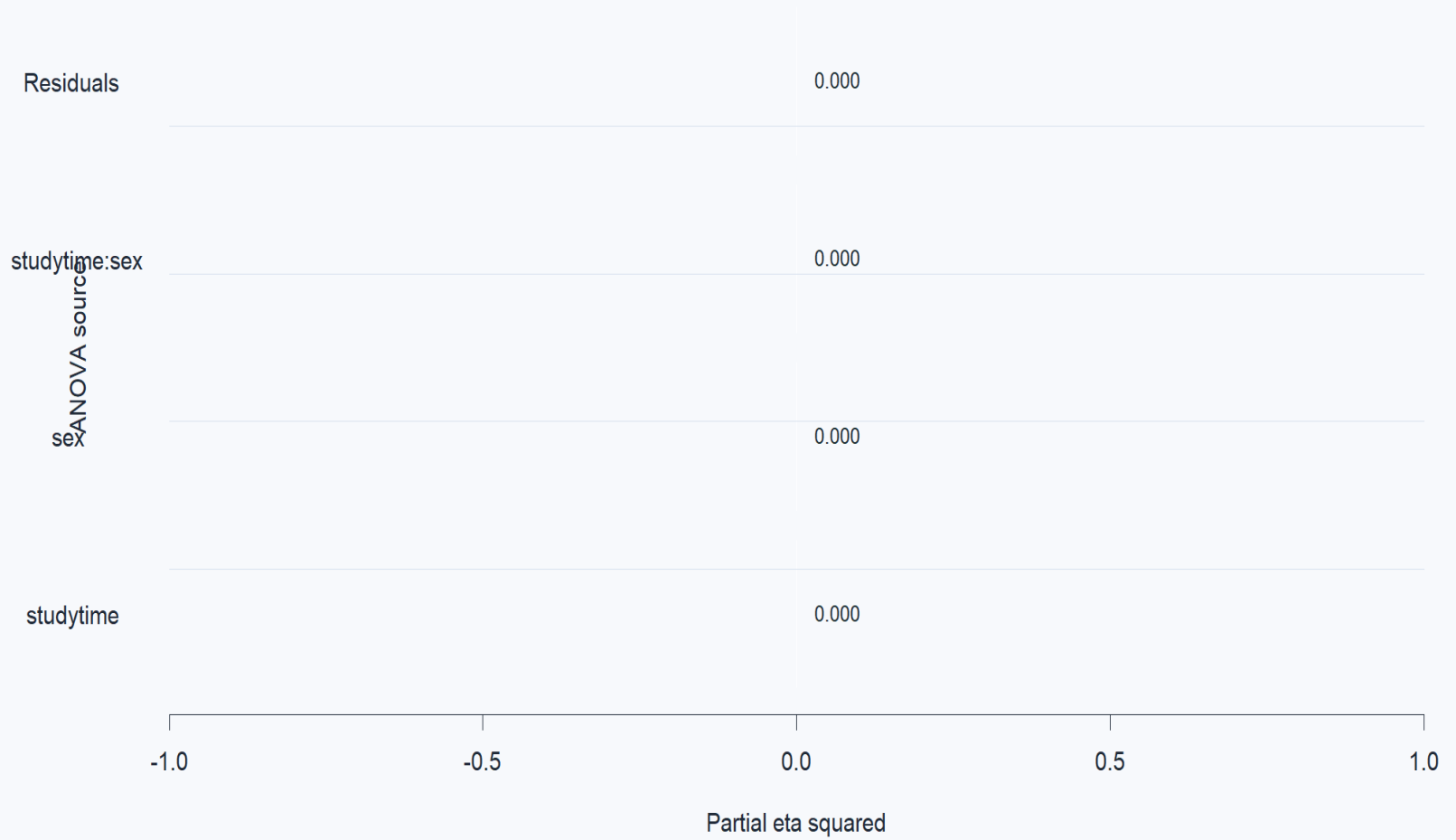
## Factorial ANOVA: p-value Decision Summary

Effects with p-values below alpha are statistically significant.



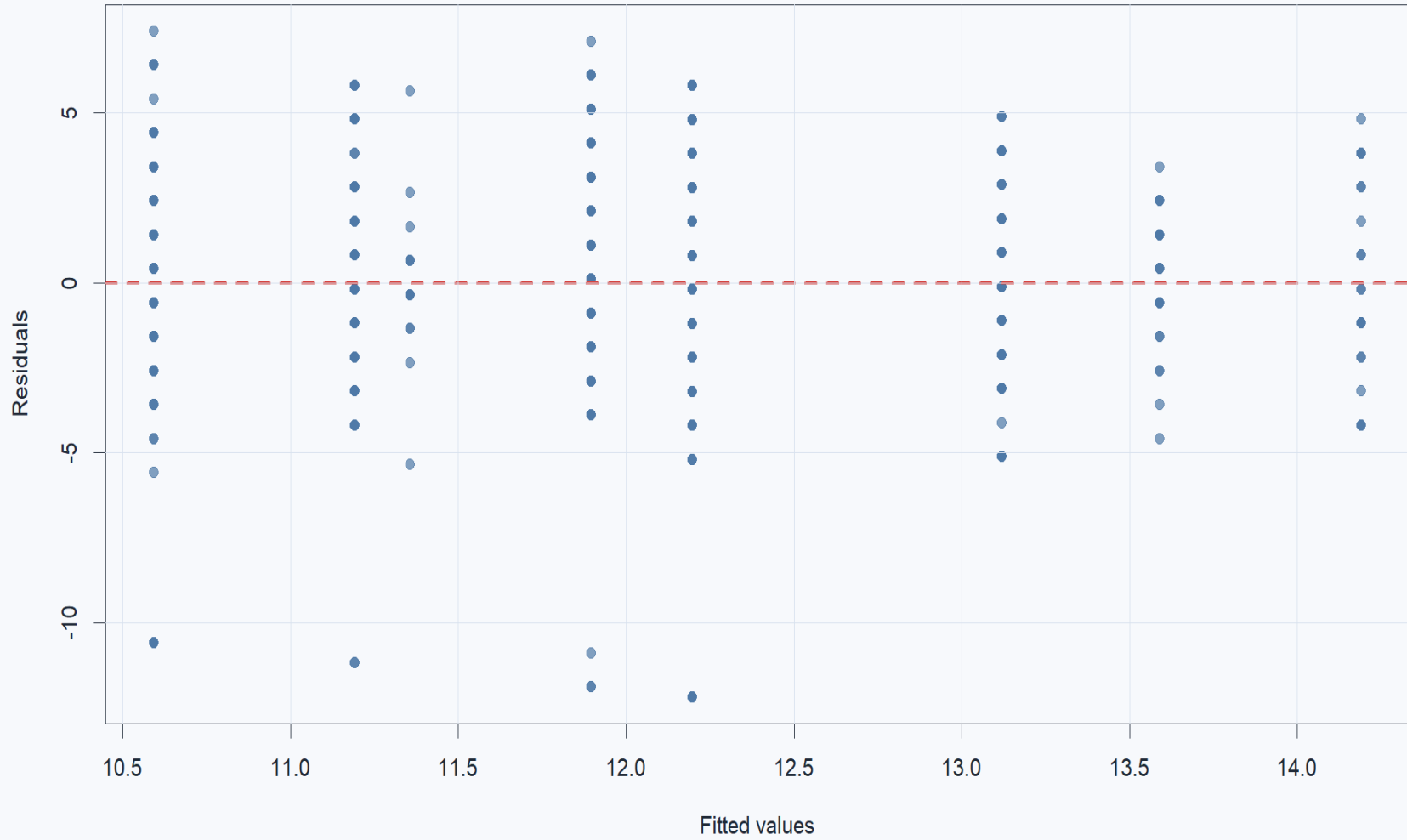
## Factorial ANOVA: Effect Size Summary

Partial eta squared shows the relative size of each main effect and interaction.



## Factorial ANOVA: Residuals vs Fitted Values

A random pattern around zero supports the model fit and variance assumptions.



## Factorial ANOVA: Q-Q Plot of Residuals

Points close to the reference line support approximate residual normality.

