

## Nested ANOVA Report

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Folder: D:\DATA ANALYSIS\E ANOVA Family\Nested ANOVA

Outcome: G3

Outer factor: school

Nested factor: studytime within school

Model: G3 ~ school + school:studytime

n = 649

Outer groups = 2

Nested cells = 8

Outer effect:  $F(1, 641) = 59.7378$ ,  $p = 4.20209e-14$

Outer decision: Reject  $H_0$

Nested effect:  $F(6, 641) = 6.3966$ ,  $p = 1.4777e-06$

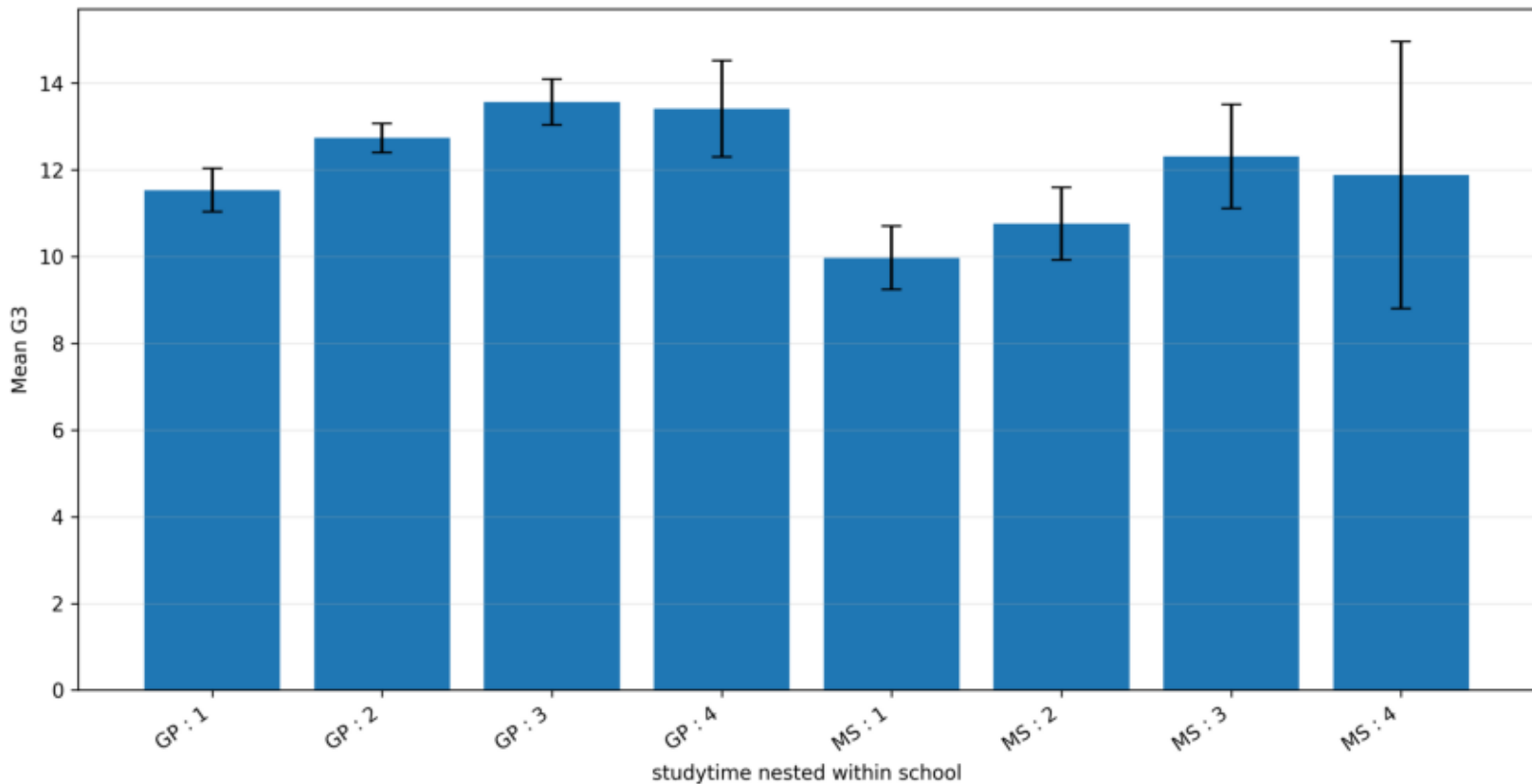
Nested decision: Reject  $H_0$

Sequential ANOVA table:

	df	sum_sq	mean_sq	F	PR(>F)
C(outer)	1.0	546.628653	546.628653	59.737838	4.202088e-14
C(outer):C(inner)	6.0	351.193505	58.532251	6.396646	1.477704e-06
Residual	641.0	5865.444406	9.150459	NaN	NaN

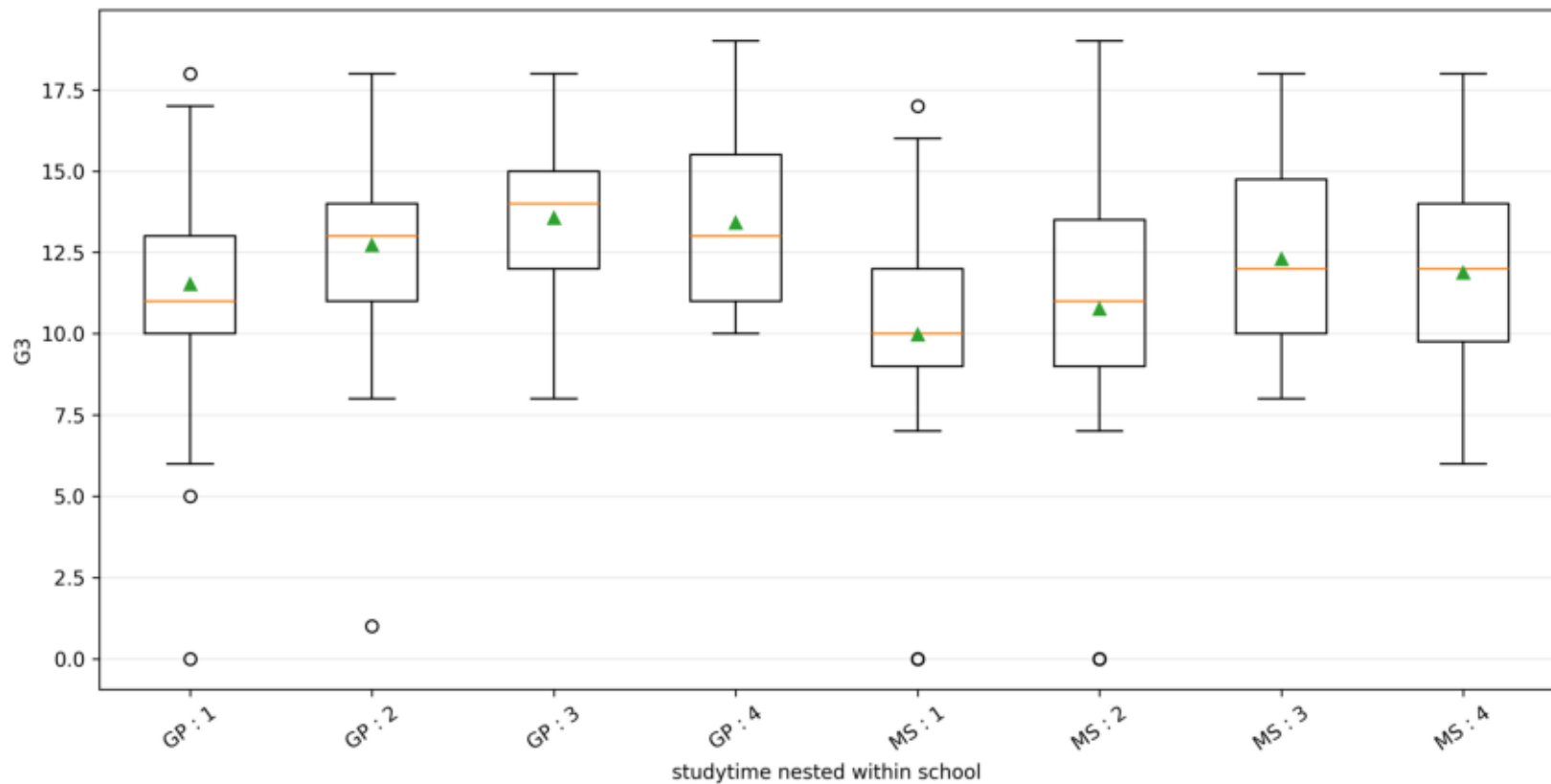
## Nested ANOVA: Nested Group Means with 95% Confidence Intervals

Each bar is a studytime group inside a school level.



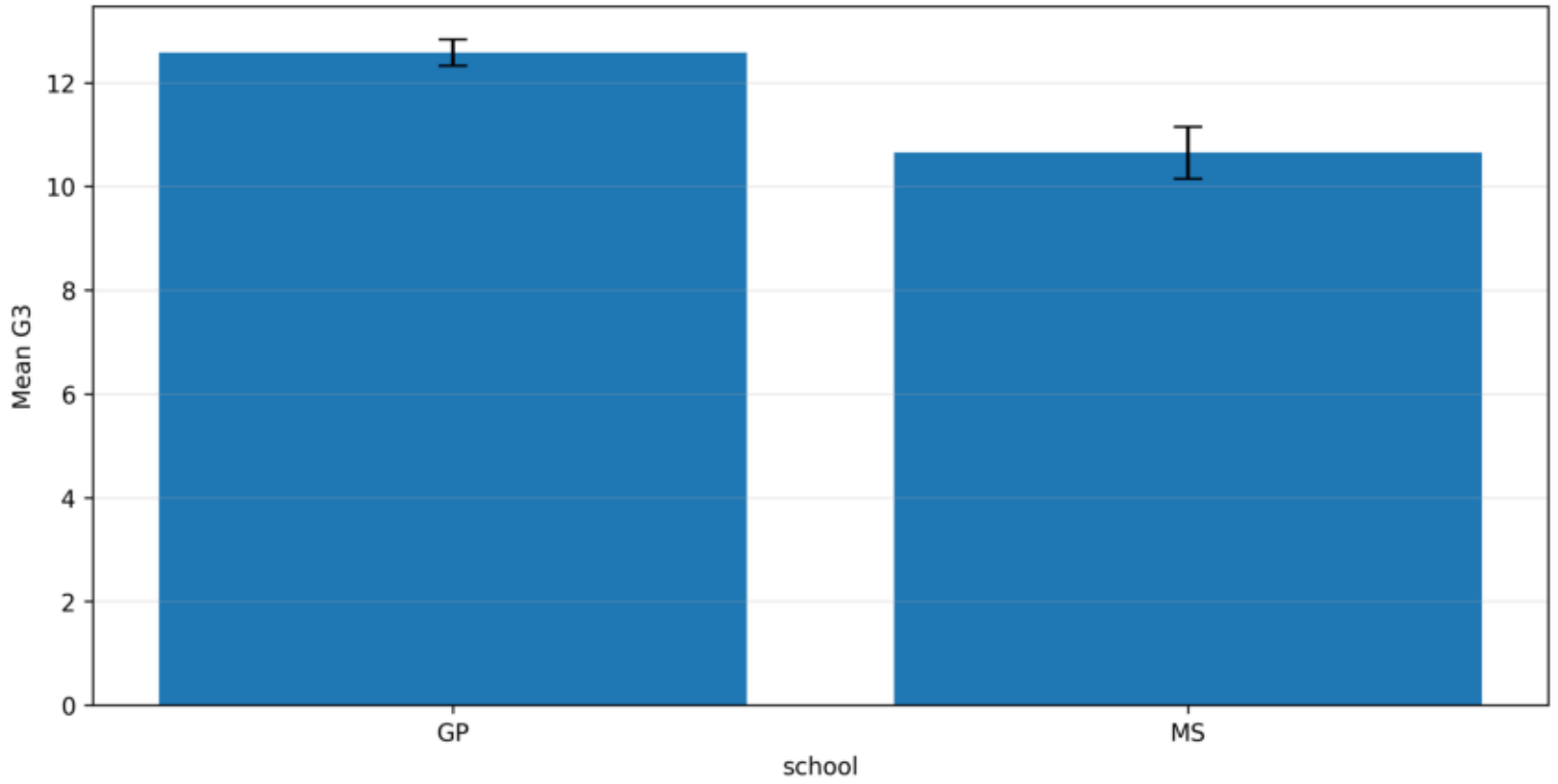
## Nested ANOVA: Distribution by Nested Cell

Boxplots show median, spread, mean marker, and possible outliers for each nested cell.



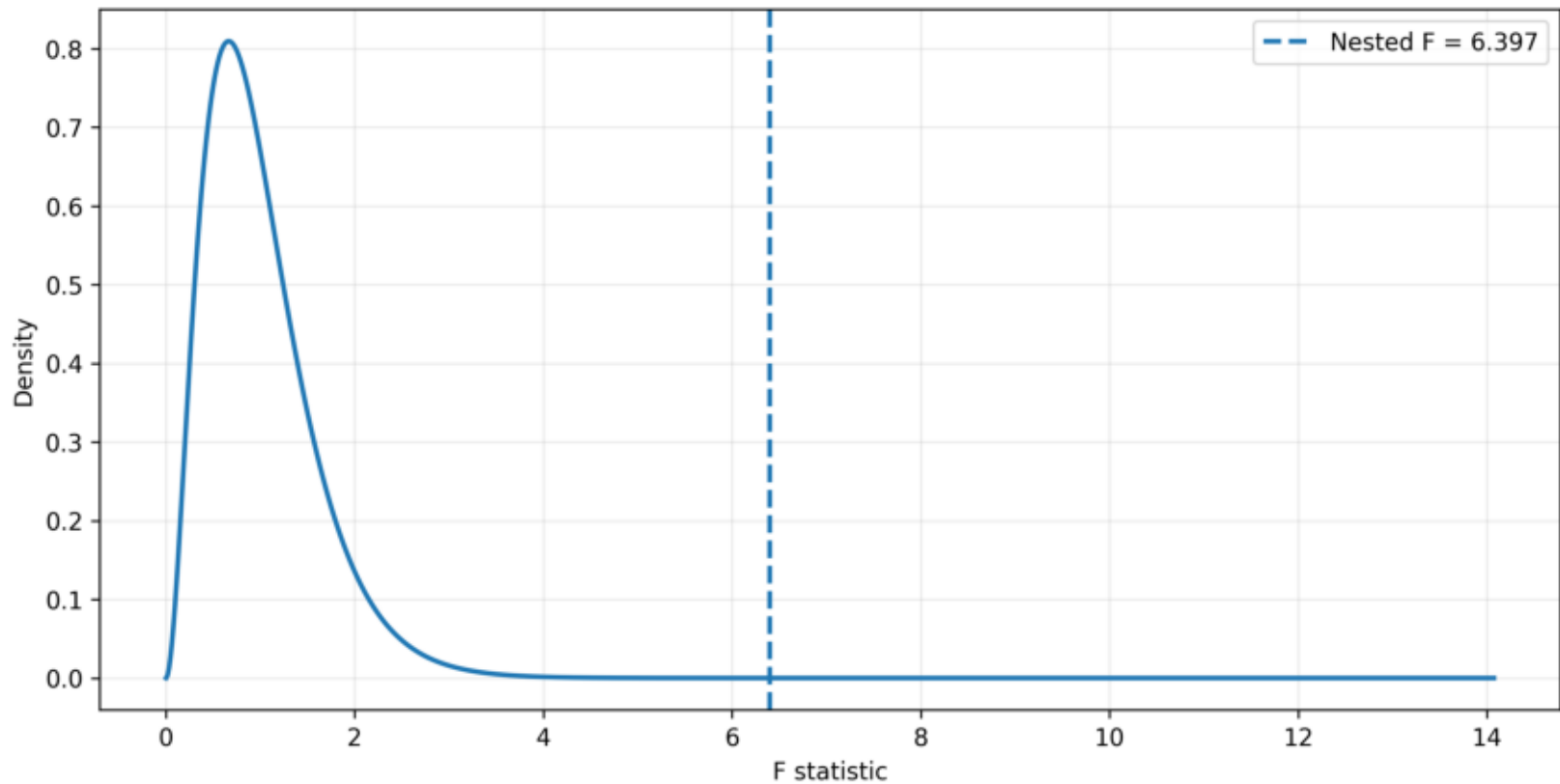
# Nested ANOVA: Outer Factor Means

This chart compares G3 across the outer factor: school.



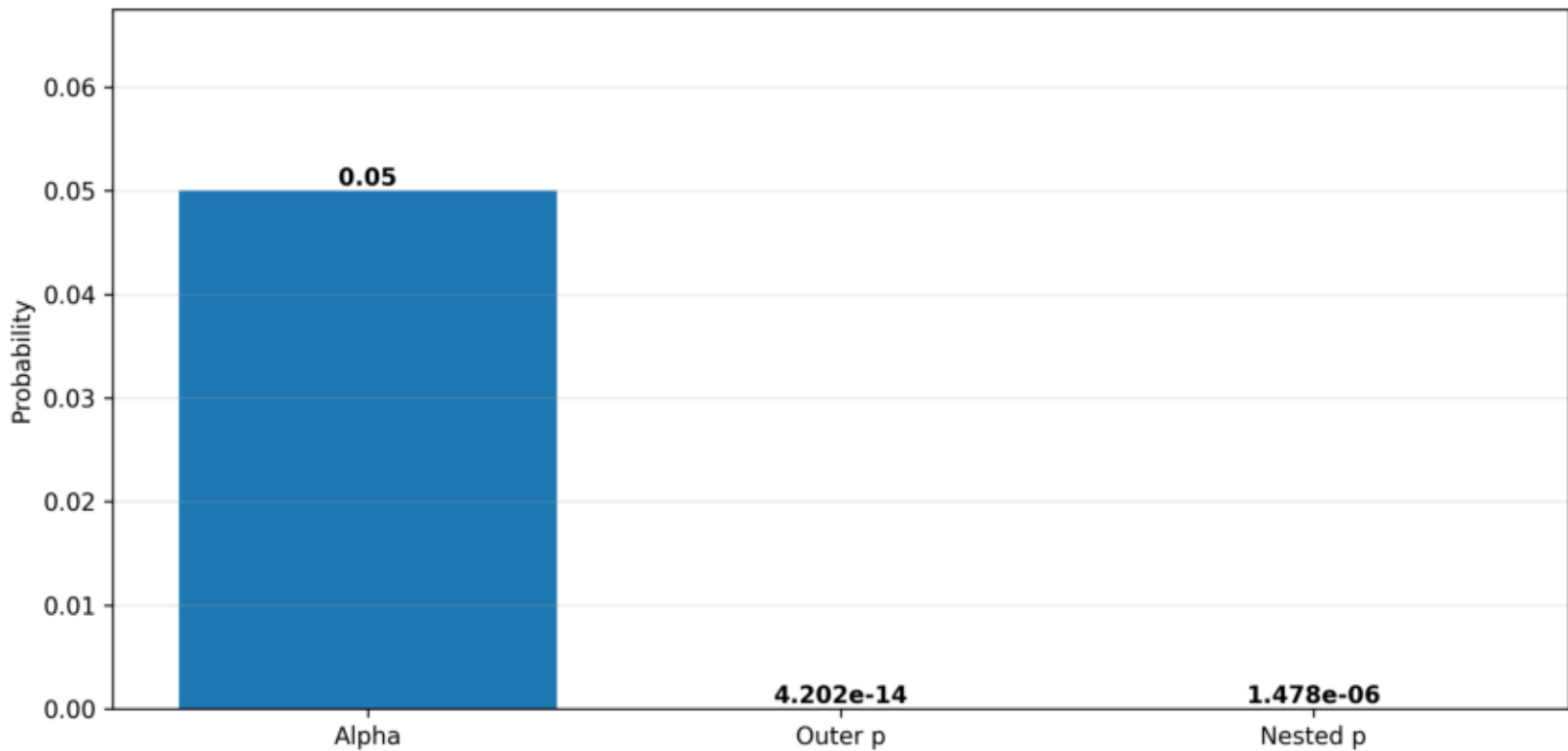
# Nested ANOVA: Nested Effect on F Distribution

Right-tail p-value =  $1.478e-06$ ; df1 = 6, df2 = 641.



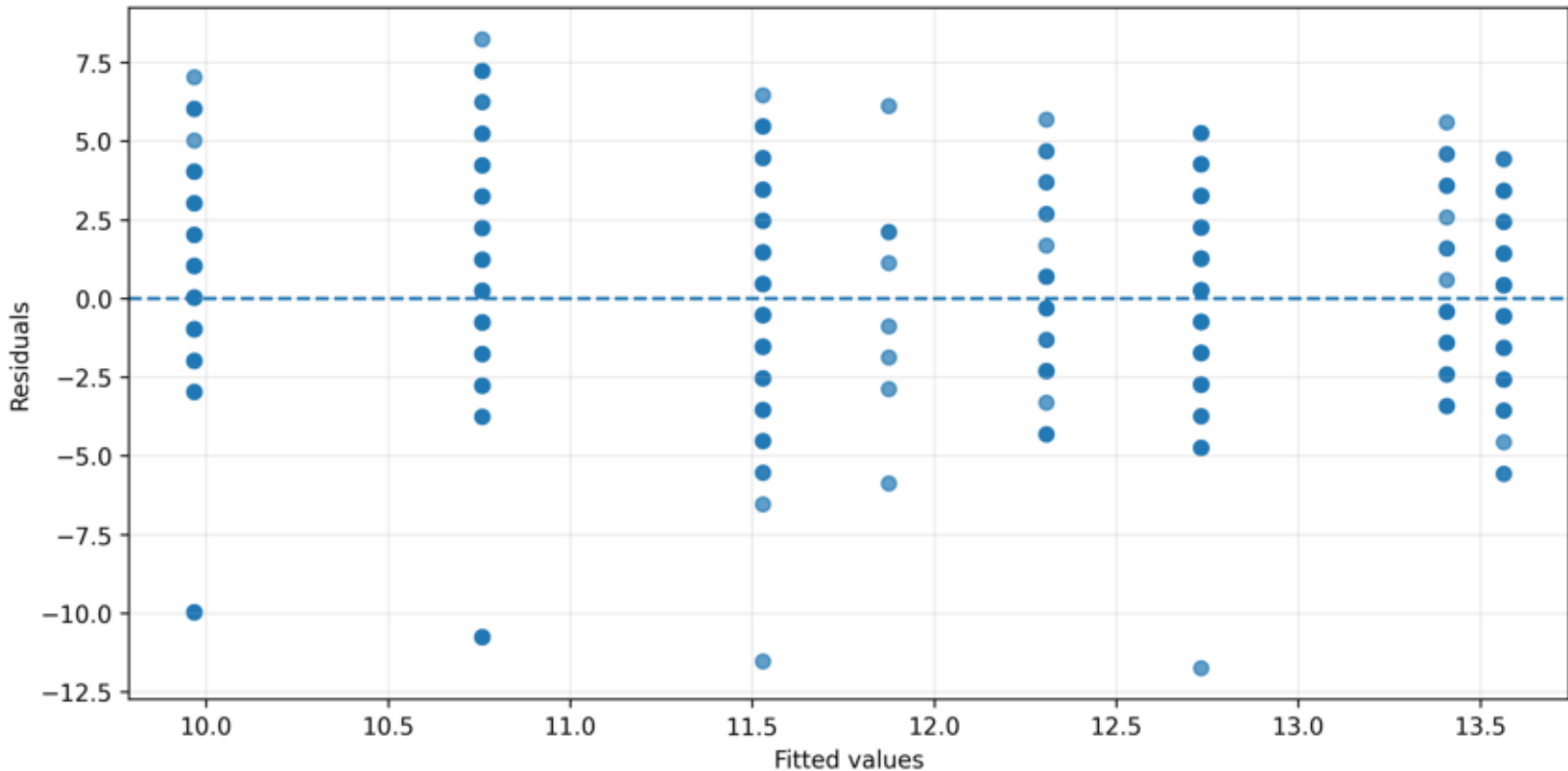
# Nested ANOVA: p-value Decision Summary

A p-value below alpha supports rejecting the corresponding null hypothesis.



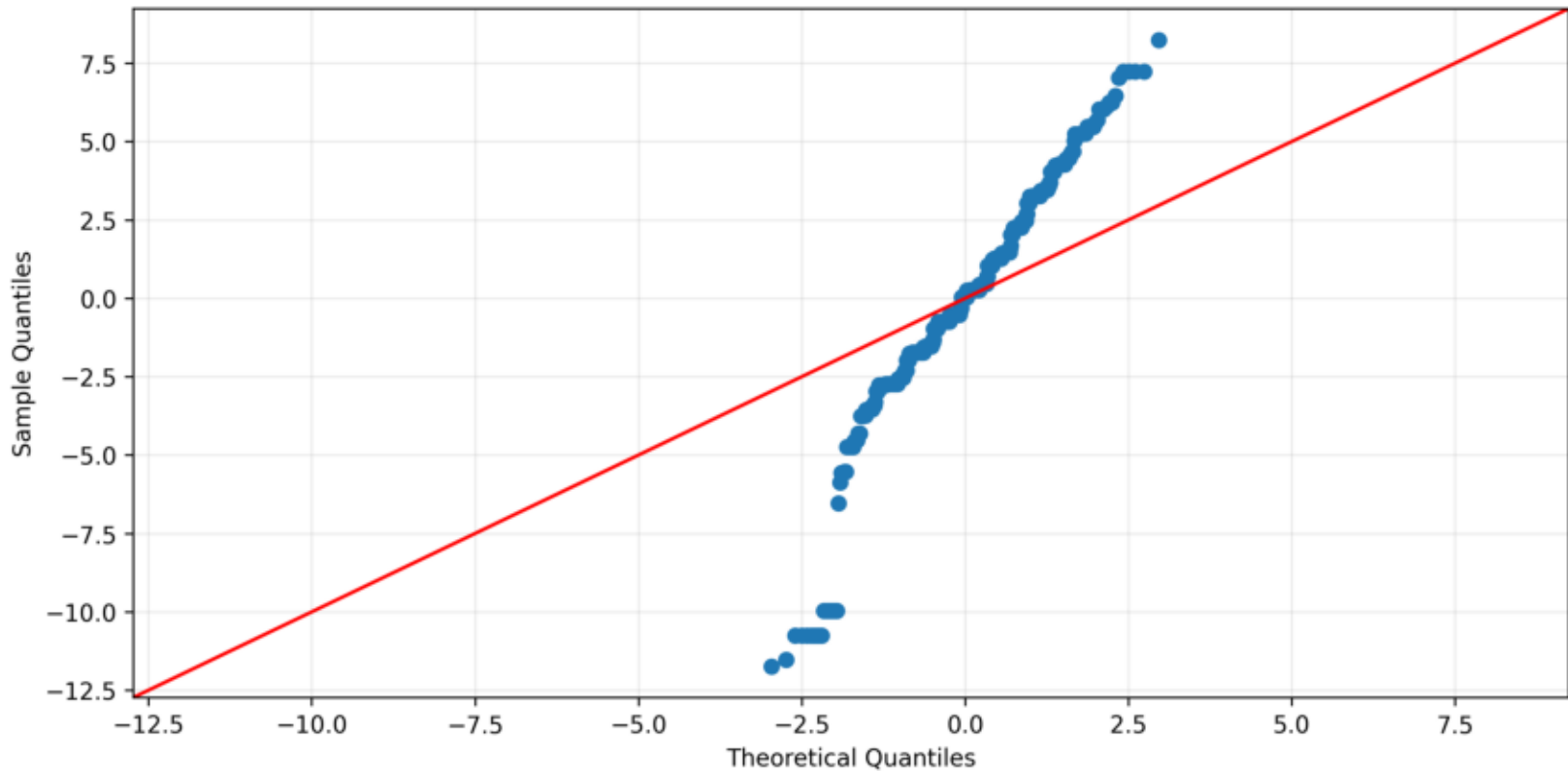
# Nested ANOVA: Residuals vs Fitted Values

A random pattern around zero supports the fitted ANOVA model.



# Nested ANOVA: O-Q Plot of Residuals

Points close to the reference line support approximate residual normality.



## Nested ANOVA: Cell Size and Standard Deviation

Nested ANOVA is interpreted with both mean differences and cell-level spread.

