Regression ANOVA Table

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Regression ANOVA Table
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Dataset: D:/DATA ANALYSIS/H Regression Tests and Models/Regression ANOVA Table/dataset.csv
Outcome: G3
Predictors: G1, G2, studytime, failures, absences
Complete observations: 649
R−squared: 0.850563
Adjusted R−squared: 0.849401
RMSE: 1.253722
Overall F(5, 643) = 731.96586
p−value: 1.325735596e−262
Decision at alpha = 0.05 : Reject the overall regression null hypothesis

Regression ANOVA table:
           source sum_of_squares  df mean_square  f_value       p_value
       Regression       5752.587   5 1150.517458 731.9659 1.325736e−262
 Residual / Error       1010.679 643    1.571818       NA            NA
            Total       6763.267 648          NA       NA            NA

Coefficient table:
        term coefficient standard_error    t_value       p_value   ci95_lower  ci95_upper
 (Intercept) −0.15519010     0.25862556 −0.6000571  5.486796e−01 −0.663042818  0.35266263
          G1  0.13945748     0.03622748  3.8494939  1.301880e−04  0.068319009  0.21059594
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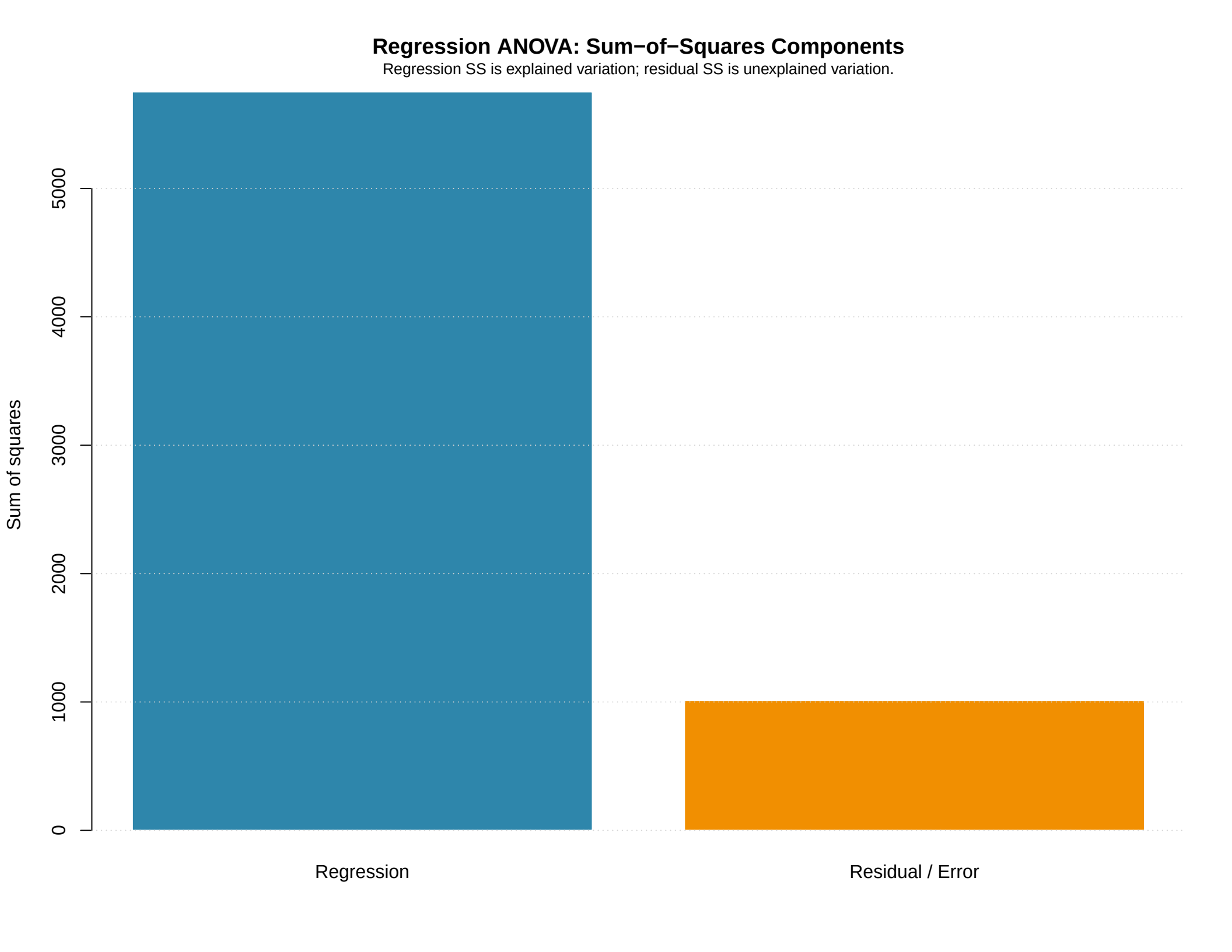
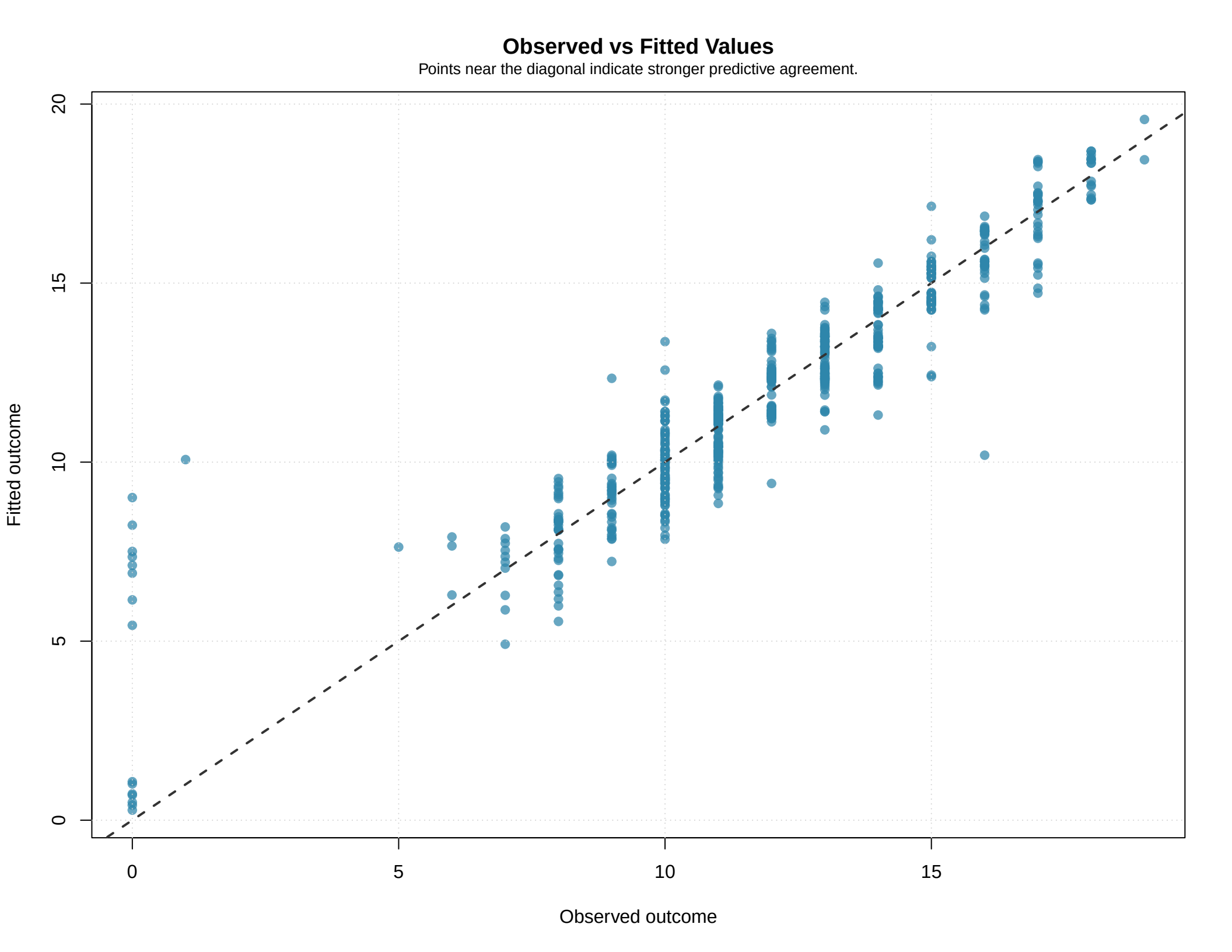
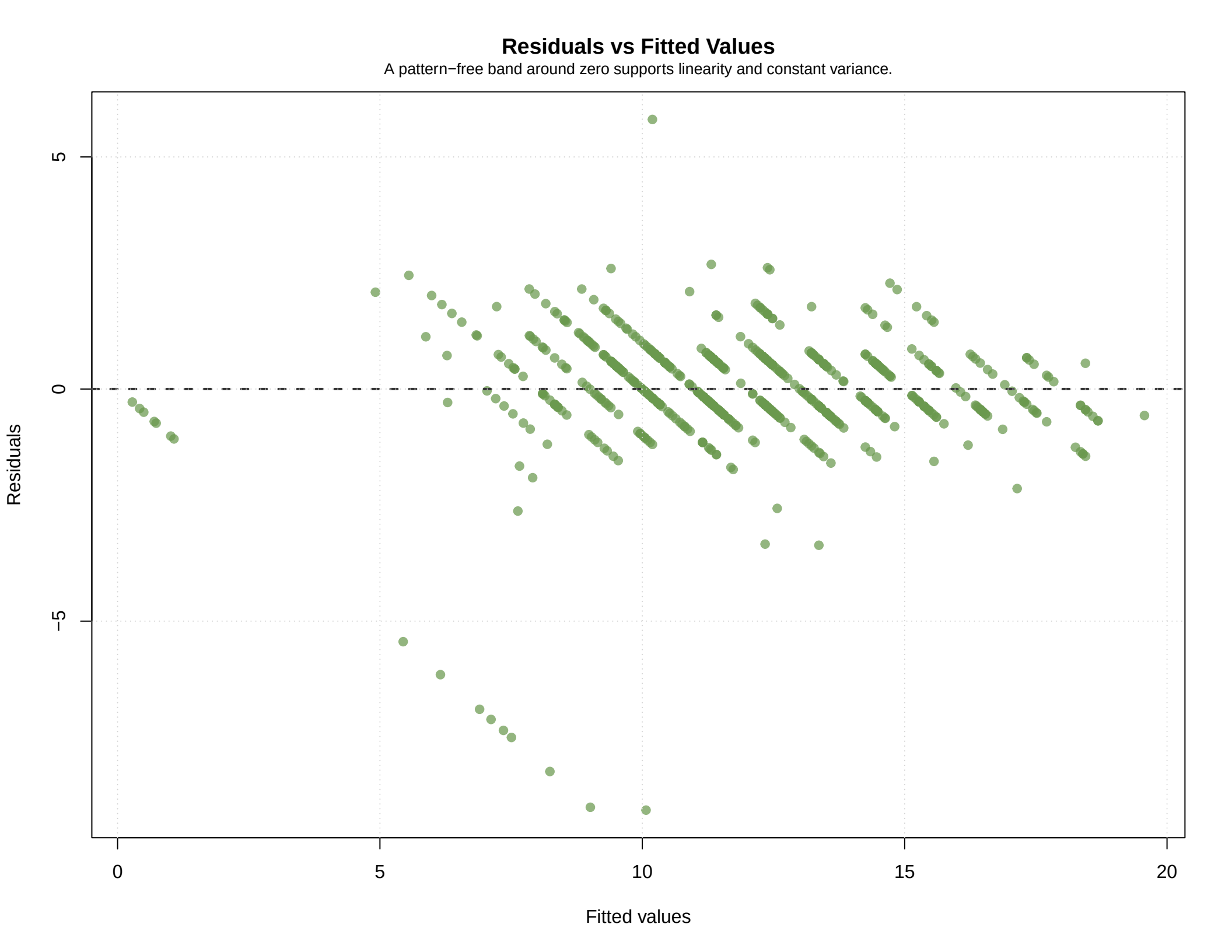
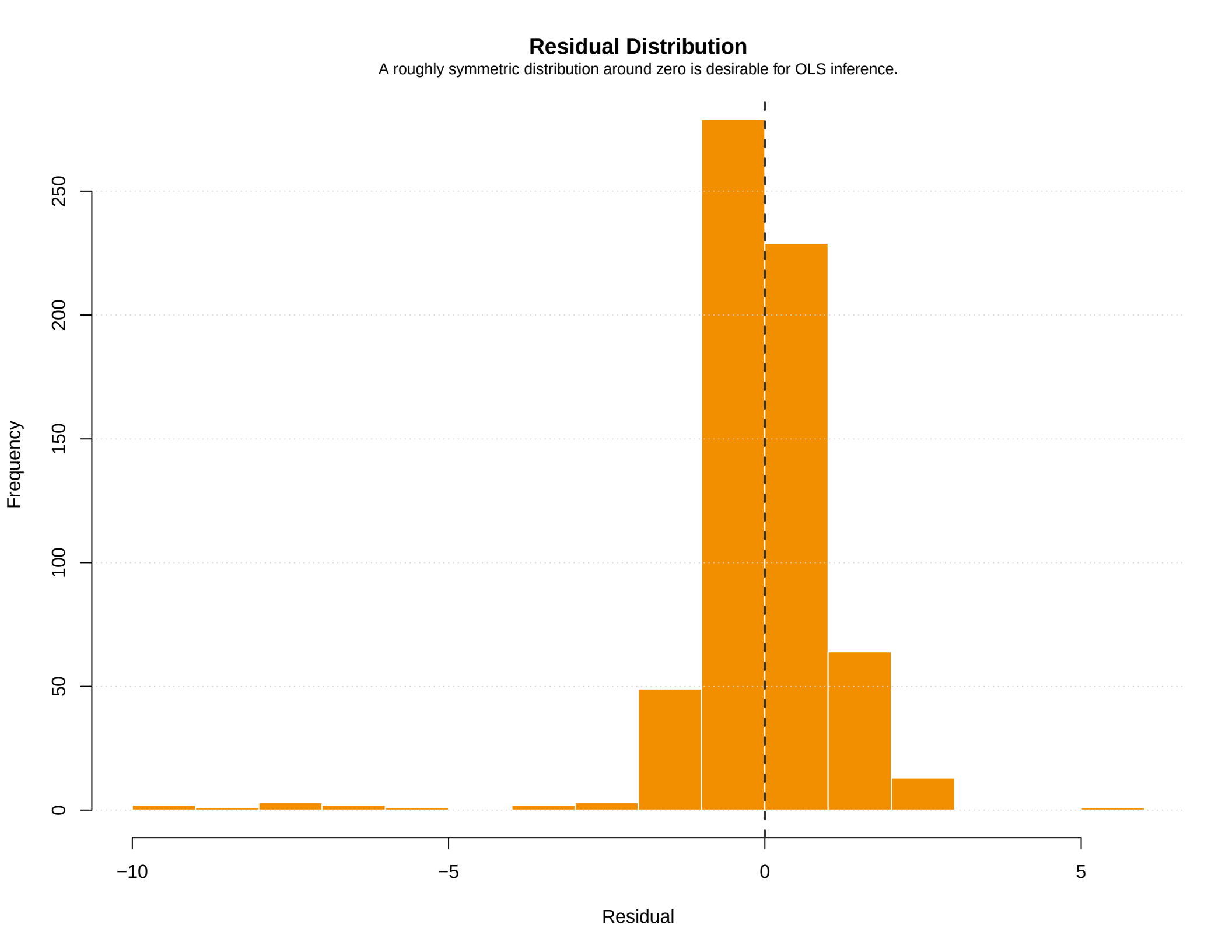
Regression ANOVA Table

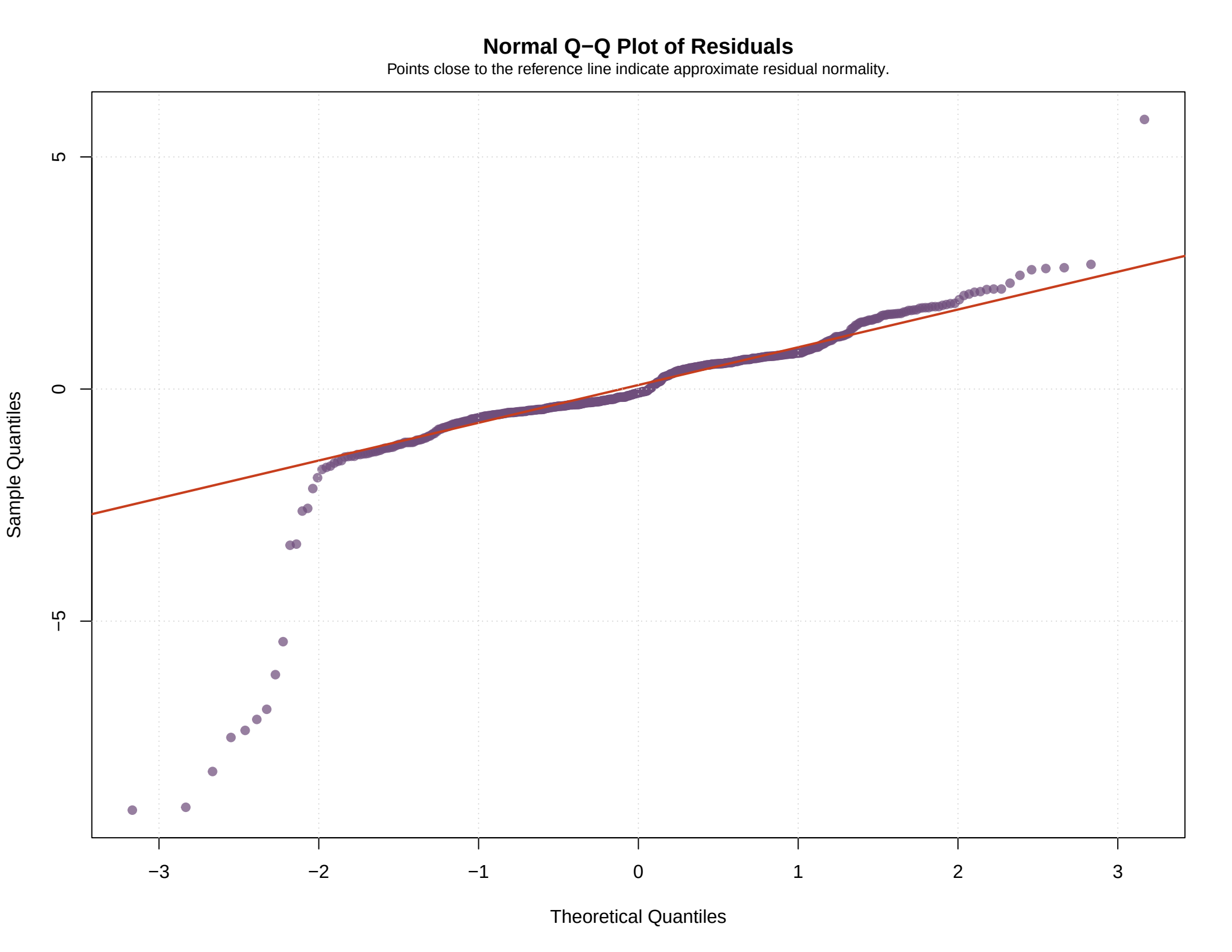
source	sum_of_squares	df	mean_square	f_value	p_value
Regression	5752.587	5	1150.517458	731.9659	1.325736e−262
Residual / Error	1010.679	643	1.571818	NA	NA
Total	6763.267	648	NA	NA	NA

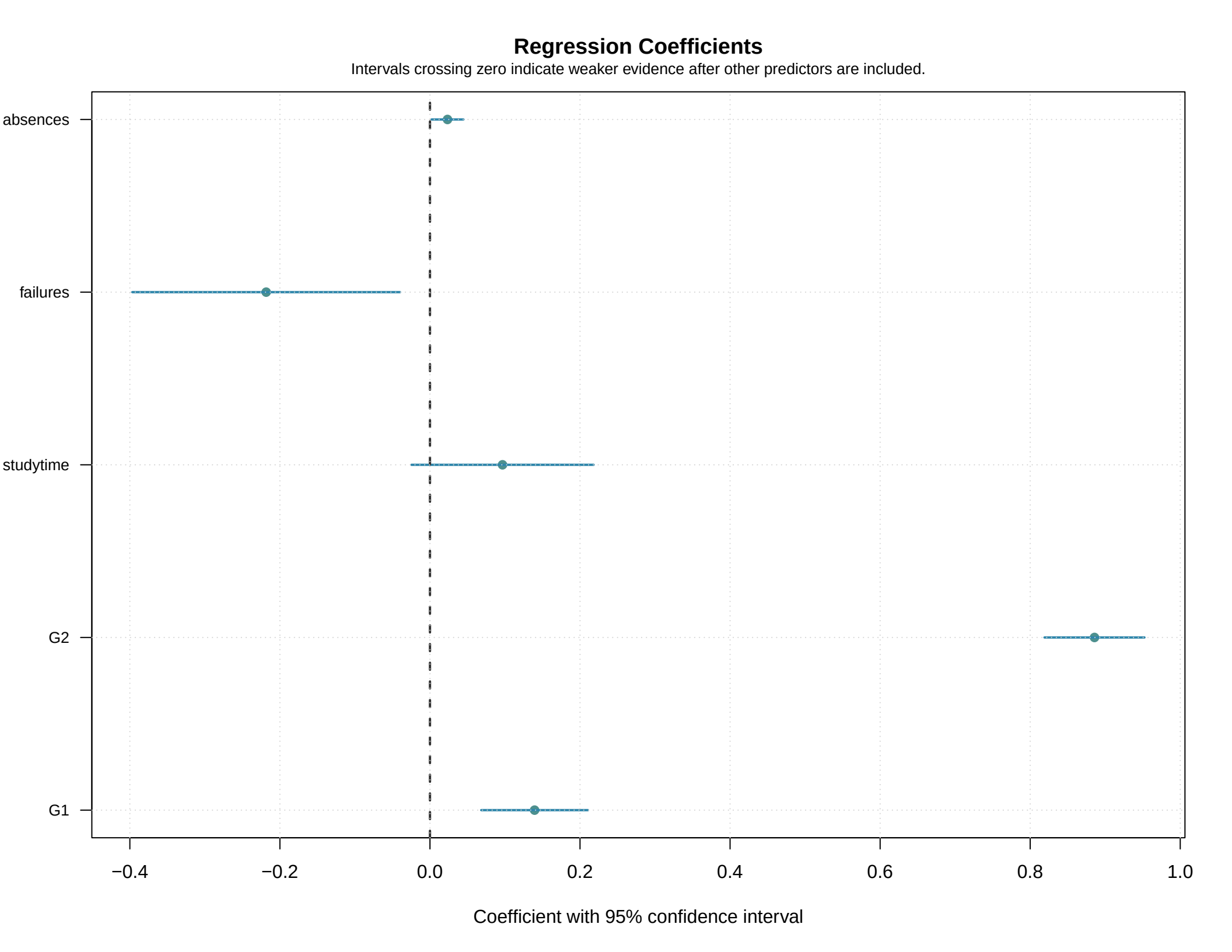

Regression ANOVA: Sum−of−Squares Components
Regression SS is explained variation; residual SS is unexplained variation.
Sum of squares
0
1000
2000
3000
4000
5000
Regression
Residual / Error

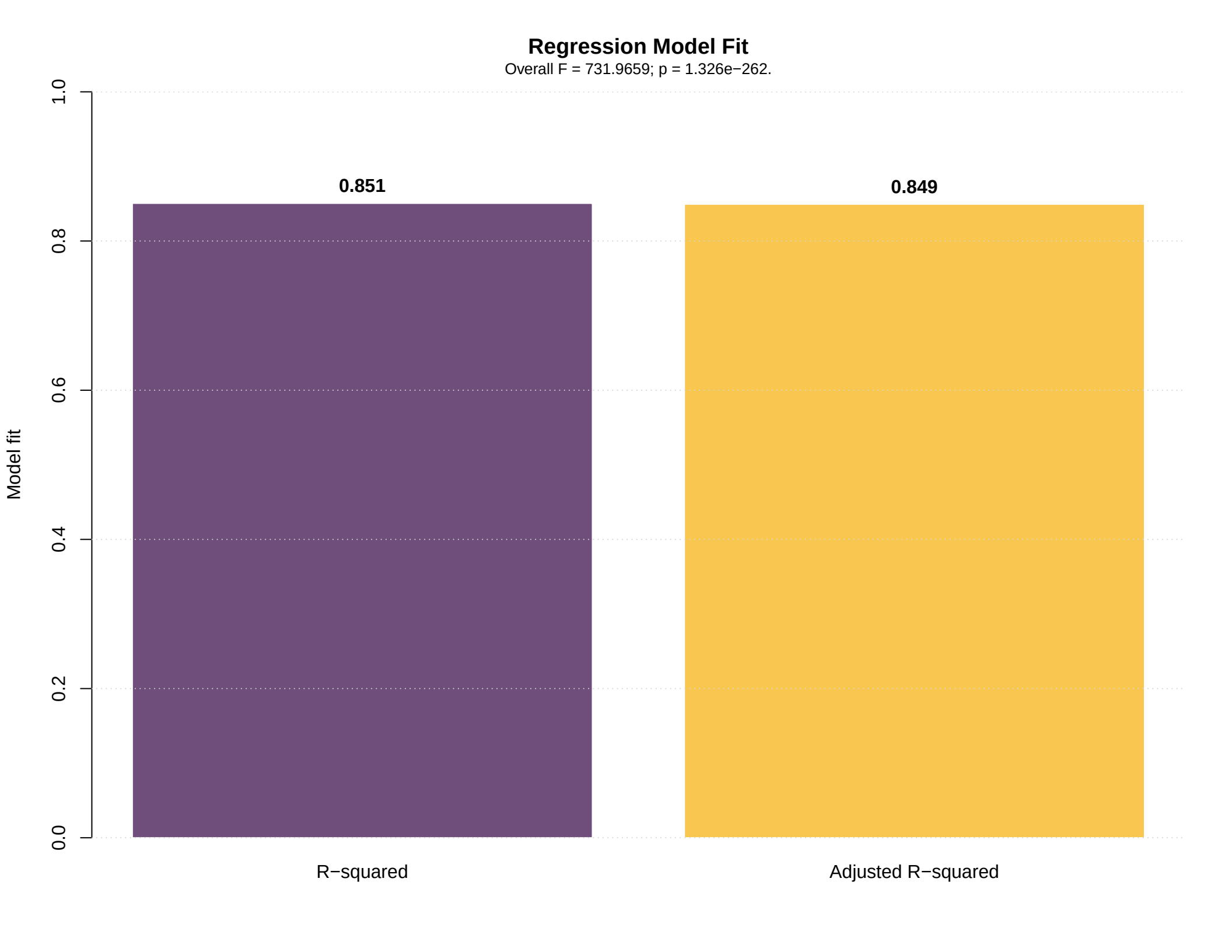

Observed vs Fitted Values
Points near the diagonal indicate stronger predictive agreement.
Fitted outcome
Observed outcome
0
5
10
15
20
0
5
10
15

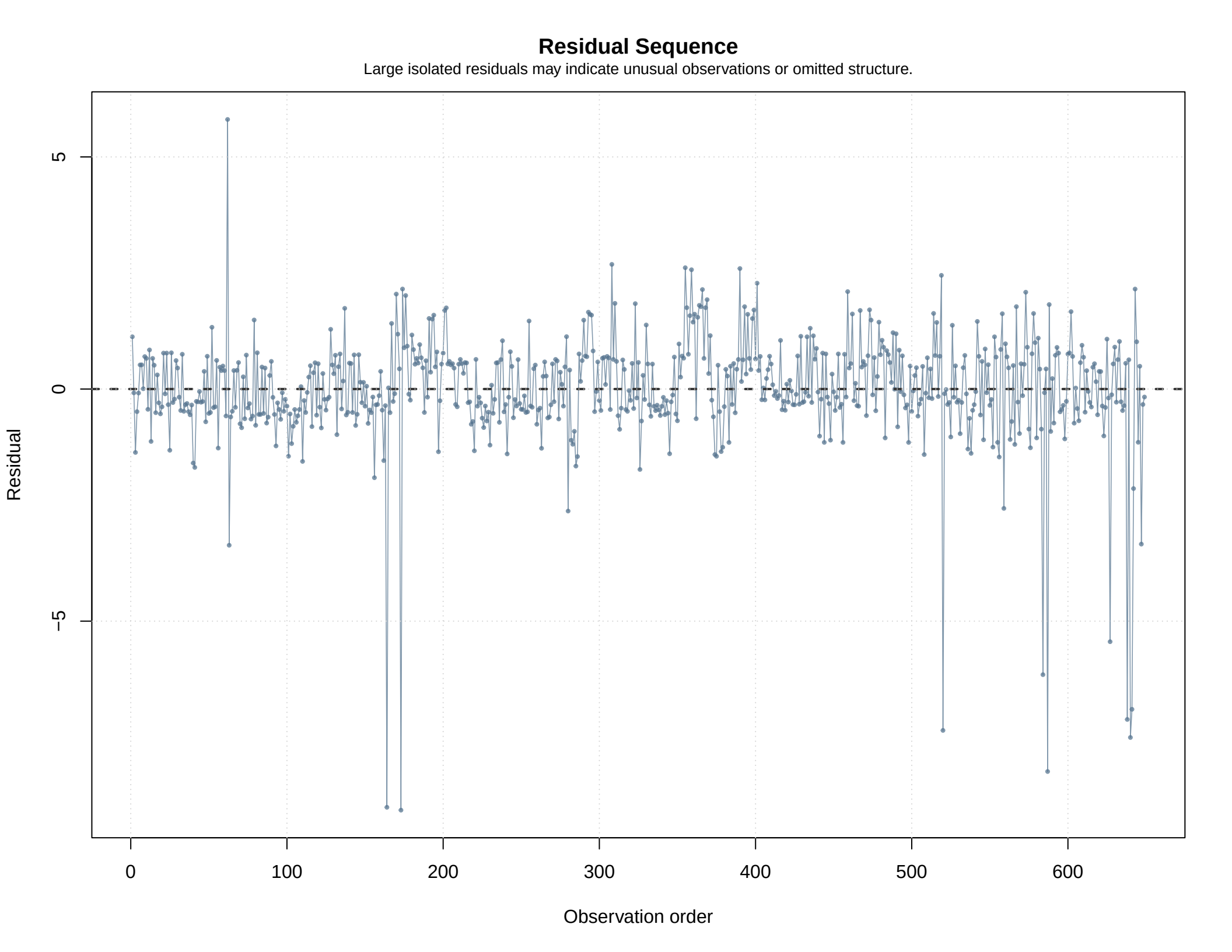

Residuals vs Fitted Values
A pattern−free band around zero supports linearity and constant variance.
Residuals
5
0
−5
0
5
10
15
20
Fitted values


Residual Distribution
A roughly symmetric distribution around zero is desirable for OLS inference.
Frequency
0
50
100
150
200
250
−10
−5
0
5
Residual


Normal Q−Q Plot of Residuals
Points close to the reference line indicate approximate residual normality.
Sample Quantiles
Theoretical Quantiles
5
0
−5
−3
−2
−1
0
1
2
3


Regression Coefficients
Intervals crossing zero indicate weaker evidence after other predictors are included.
absences
failures
studytime
G2
G1
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
1.0
Coefficient with 95% confidence interval


Regression Model Fit
Overall F = 731.9659; p = 1.326e−262.
Model fit
1.0
0.8
0.6
0.4
0.2
0.0
0.851
0.849
R−squared
Adjusted R−squared


Residual Sequence
Large isolated residuals may indicate unusual observations or omitted structure.
Residual
5
0
−5
0
100
200
300
400
500
600
Observation order