Regression P Value

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Dataset: D:\DATA ANALYSIS\H Regression Tests and Models\Regression Residual Analysis\dataset.csv

Outcome: G3

Predictors: G1, G2, studytime, failures, absences, age, Medu, Fedu

Complete observations: 649

R-squared: 0.850777

Adjusted R-squared: 0.848912

Overall F statistic: 456.111097

Overall model p-value: 1.454898041e-258

RMSE: 1.255758

Strongest standardized predictor: G2 (beta = 0.797983)

Interpretation guide:

- Unstandardized B is the expected outcome change for one unit of the predictor, holding the others constant.

- Standardized beta compares predictor strength using standard-deviation units.

- A 95% confidence interval excluding zero and p < 0.05 indicate stronger evidence of a unique coefficient effect.

- The squared semi-partial correlation is the predictor's unique contribution to R-squared.

- VIF values of 5 or more warrant closer multicollinearity review.

Charts generated: 8

Regression coefficients

term	coefficient_b	standard_error	t_value	p_value	ci95_lower	ci95_upper	decision_alpha_0_05
const	-0.501155	0.773950	-0.647528	0.517522	-2.020944	1.018634	Not statistically significant
G1	0.143397	0.036672	3.910266	0.000102	0.071385	0.215408	Statistically significant
G2	0.884807	0.034369	25.743971	0.000000	0.817317	0.952298	Statistically significant
studytime	0.096632	0.062091	1.556299	0.120131	-0.025294	0.218558	Not statistically significant
failures	-0.235361	0.095234	-2.471387	0.013718	-0.422371	-0.048351	Statistically significant
absences	0.022762	0.010919	2.084572	0.037504	0.001320	0.044204	Statistically significant
age	0.022685	0.043668	0.519501	0.603591	-0.063064	0.108435	Not statistically significant
Medu	-0.044951	0.057938	-0.775854	0.438122	-0.158722	0.068820	Not statistically significant
Fedu	0.022025	0.059316	0.371325	0.710518	-0.094451	0.138502	Not statistically significant

Standardized coefficients

term	unstandardized_b	standardized_beta	absolute_standardized_beta
G2	0.884807	0.797983	0.797983
G1	0.143397	0.121852	0.121852
failures	-0.235361	-0.043219	0.043219
absences	0.022762	0.032697	0.032697
studytime	0.096632	0.024811	0.024811
Medu	-0.044951	-0.015786	0.015786
age	0.022685	0.008554	0.008554
Fedu	0.022025	0.007499	0.007499

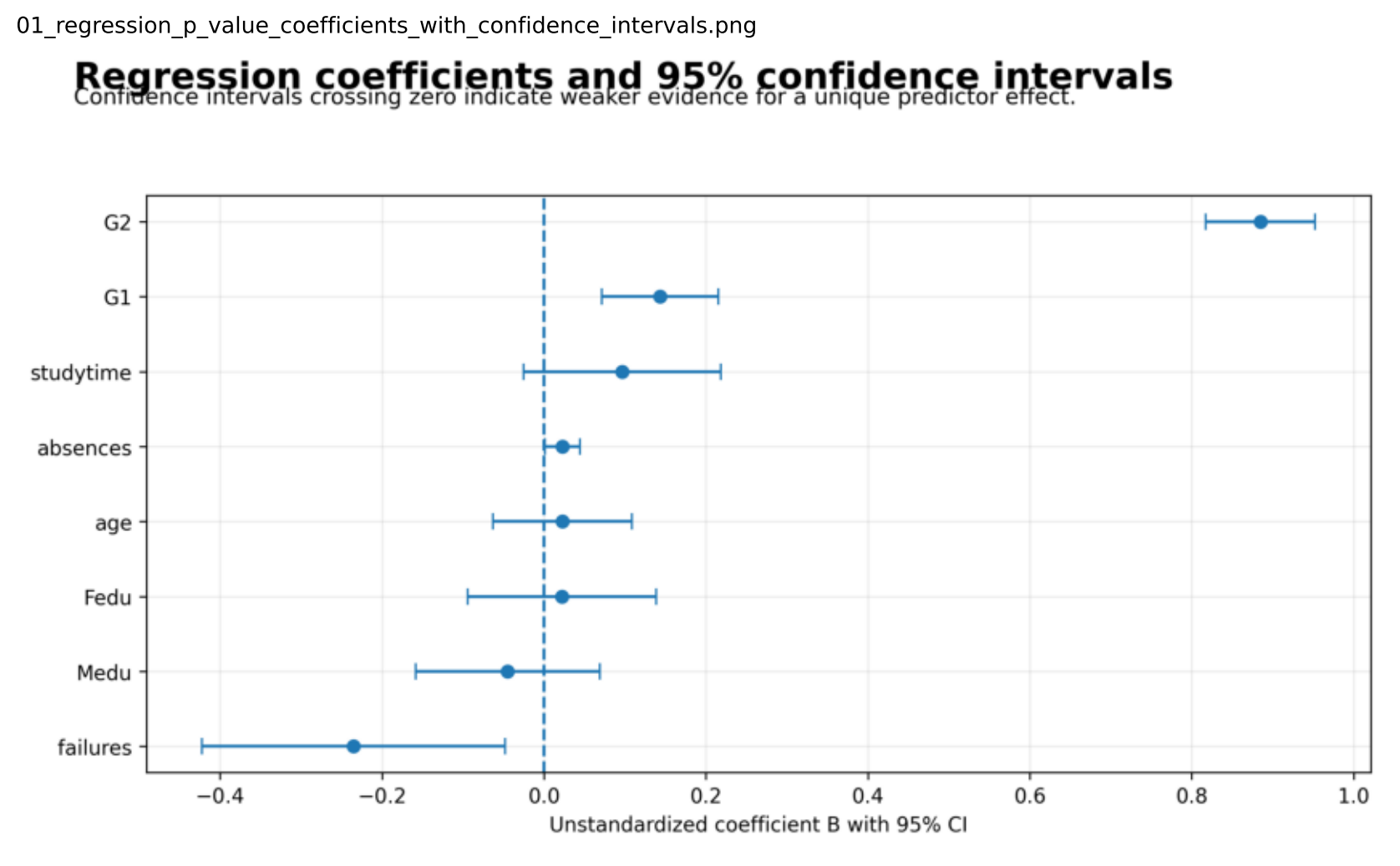
Zero-order, partial, and part correlations

term	zero_order_correlation	partial_correlation	semi_partial_part_correlation	unique_r_squared_contribution
G1	0.826387	0.152753	0.059708	0.003565
G2	0.918548	0.713255	0.393100	0.154528
studytime	0.249789	0.061402	0.023764	0.000565
failures	-0.393316	-0.097227	-0.037737	0.001424
absences	-0.091379	0.082122	0.031831	0.001013
age	-0.106505	0.020531	0.007933	0.000063
Medu	0.240151	-0.030654	-0.011847	0.000140
Fedu	0.211800	0.014676	0.005670	0.000032

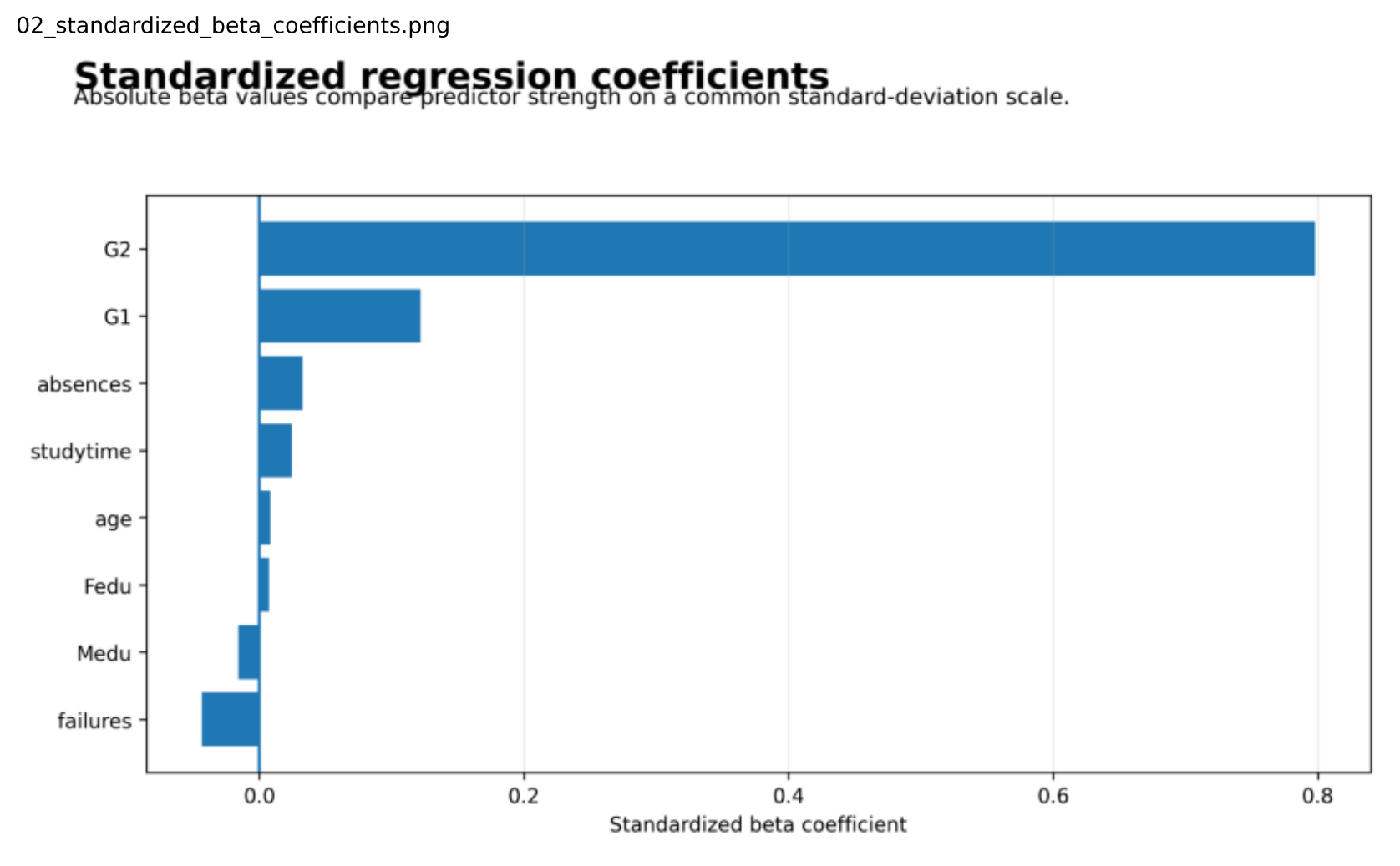
Multicollinearity statistics

term	vif	tolerance	decision
const	246.523996	0.004056	Acceptable
G1	4.164832	0.240106	Acceptable
G2	4.120795	0.242672	Acceptable
studytime	1.090085	0.917360	Acceptable
failures	1.311611	0.762421	Acceptable
absences	1.055187	0.947699	Acceptable
age	1.162734	0.860042	Acceptable
Medu	1.775552	0.563205	Acceptable
Fedu	1.749166	0.571701	Acceptable

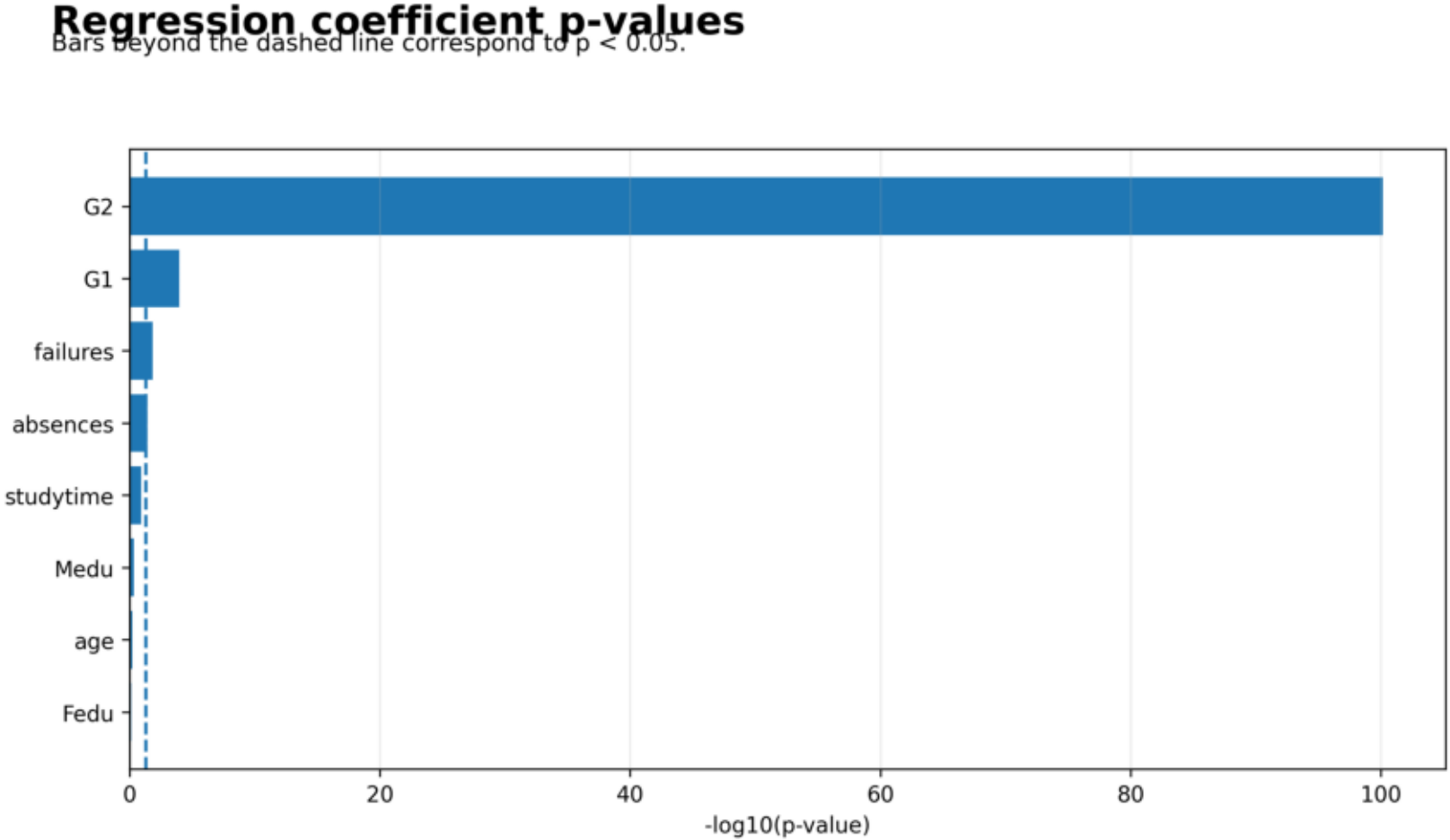
01_regression_p_value_coefficients_with_confidence_intervals.png



02_standardized_beta_coefficients.png



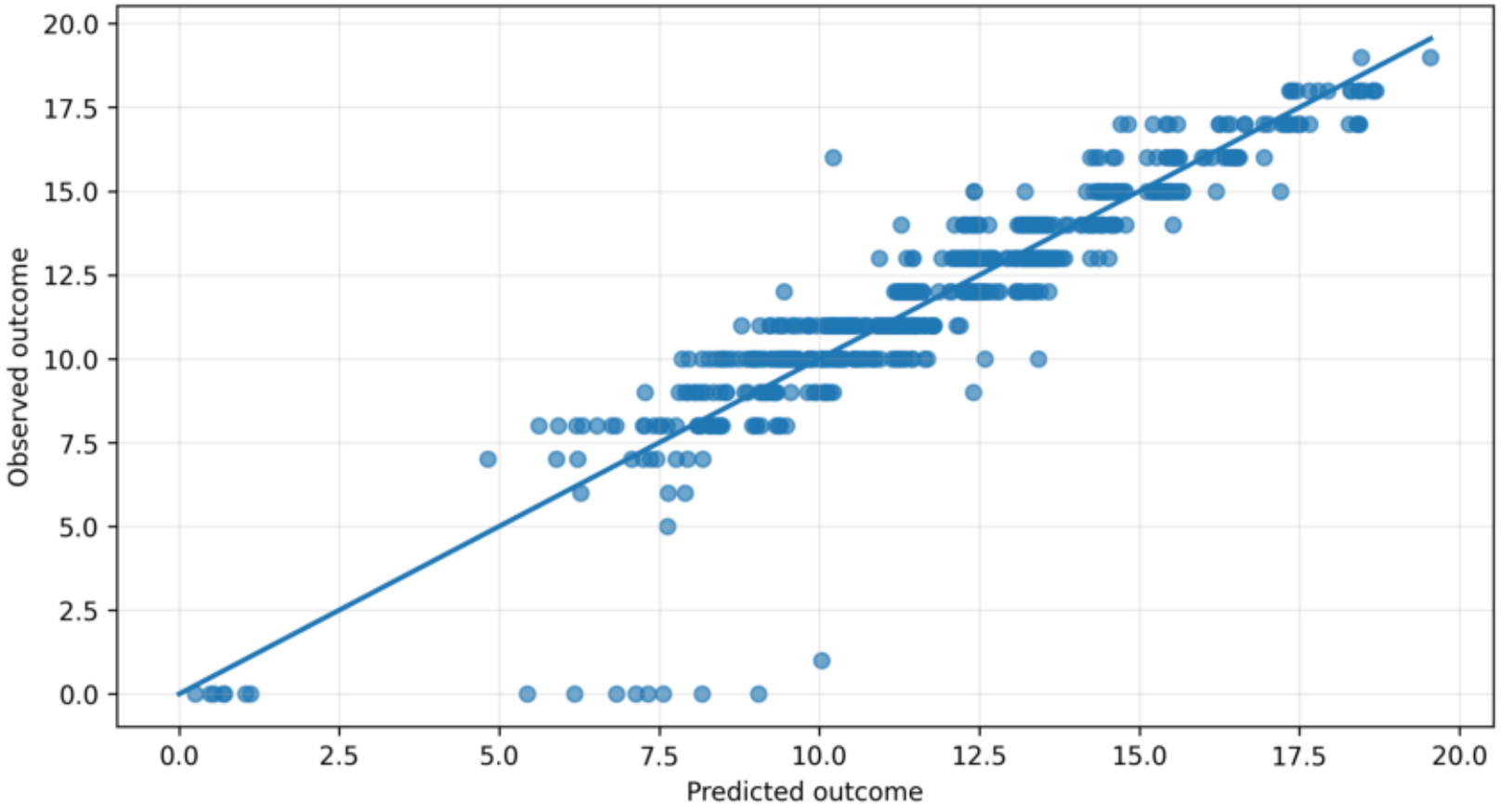
03_regression_p_values_minus_log10.png



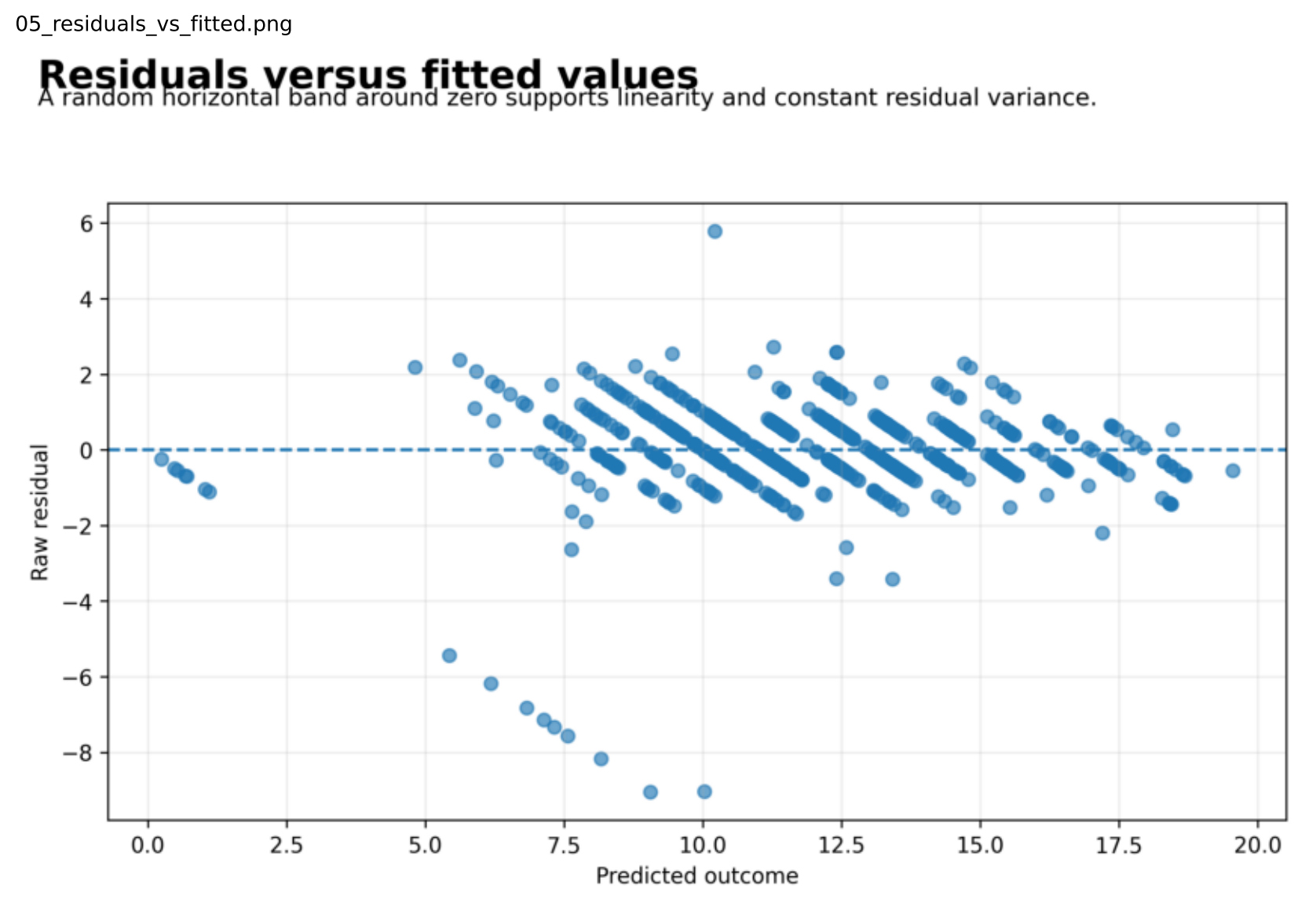
04_observed_vs_predicted.png

Observed versus predicted values

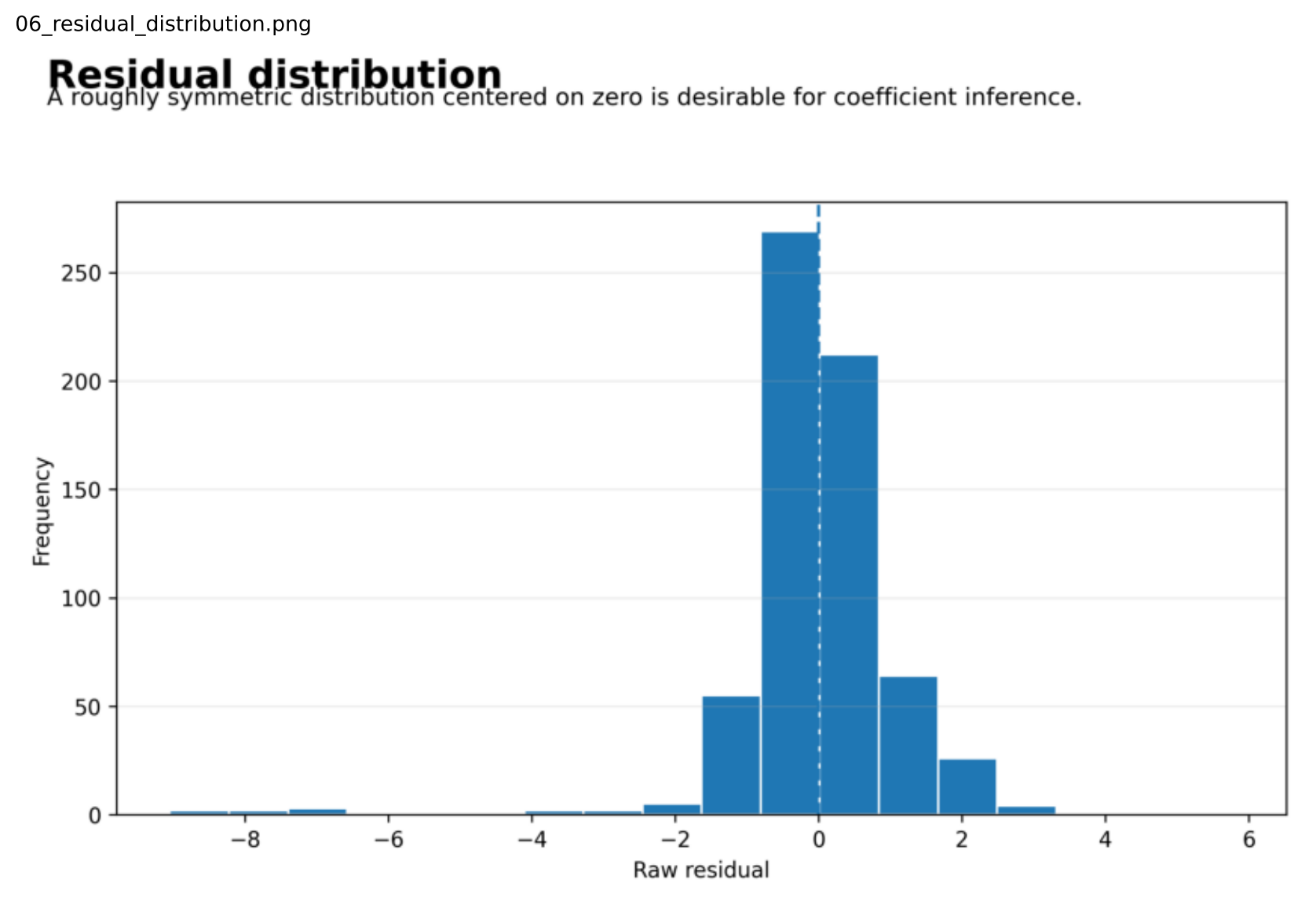
Points near the diagonal indicate close agreement between observed and fitted values.



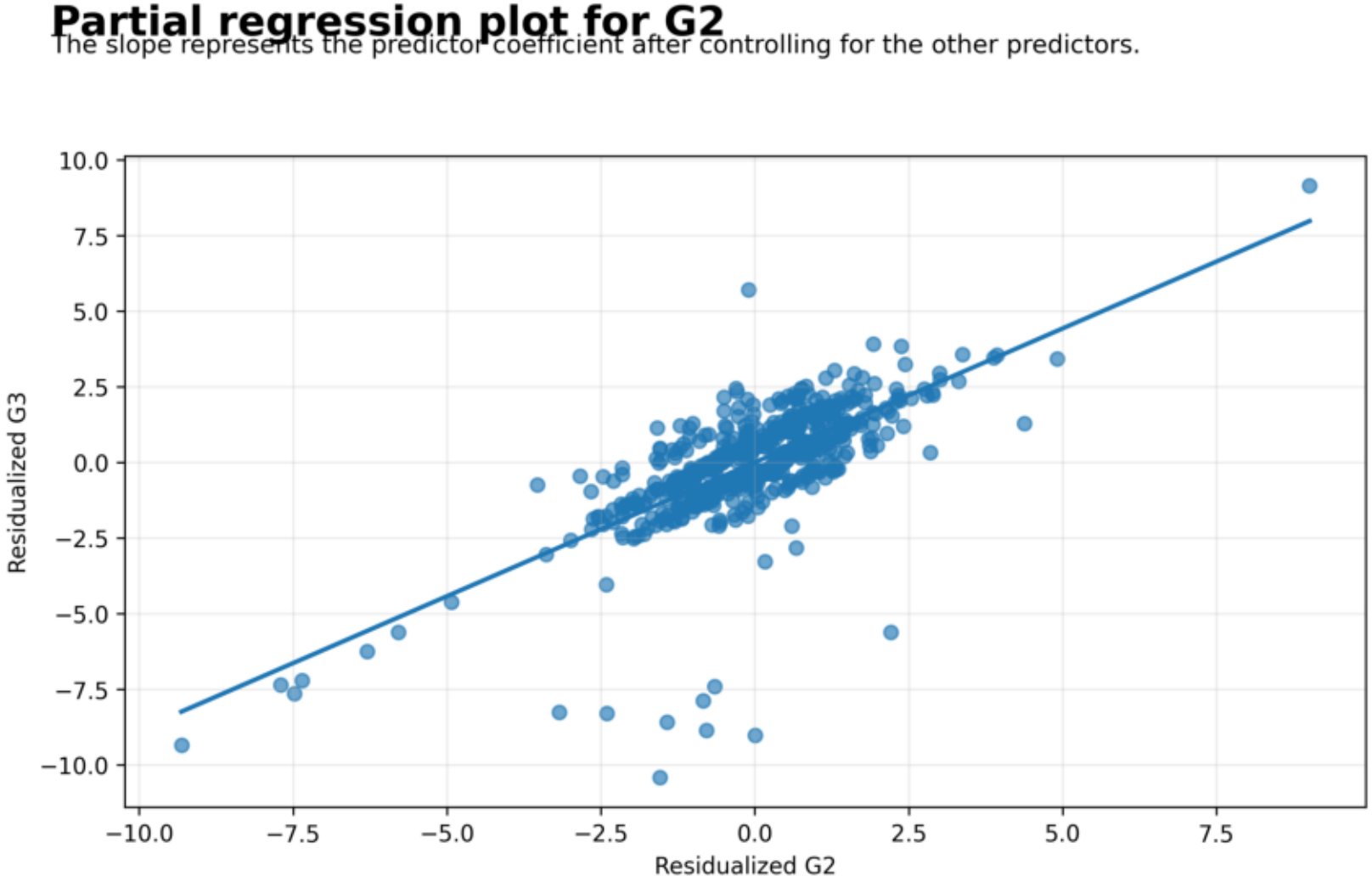
05_residuals_vs_fitted.png



06_residual_distribution.png



07_partial_regression_strongest_predictor.png



08_coefficient_correlation_contributions.png