

Sidak Correction Post Hoc Analysis

Purpose: control familywise error across multiple pairwise comparisons.  
 Formula: adjusted p = 1 - (1 - unadjusted p)^m, where m is the number of comparisons.

Interpretation summary:

analysis	target_variable	group_variable	number_of_groups	number_of_pairwise_comparisons	familywise_alpha	sidak_per_comparison_alpha	anova_p_value	anova_decision	alpha_0_05	significant_sidak_pairs	smallest_adjusted_p_comparison	smallest_sidak_adjusted_p
Sidak correction post hoc analysis	G3	studytime	4	6	0.05	0.008512	5.705728e-10	Reject equal group means		4	1 vs 3	5.371757e-09

Sidak correction controls familywise error and is usually slightly less conservative than Bonferroni when tests are independent

ANOVA table:

source	sum_of_squares	df	mean_square	f_value	p_value
Between groups	465.077825	3	155.025942	15.876268	5.705728e-10
Within groups	6298.188739	645	9.764634	NaN	NaN
Total	6763.266564	648	NaN	NaN	NaN

Group summary:

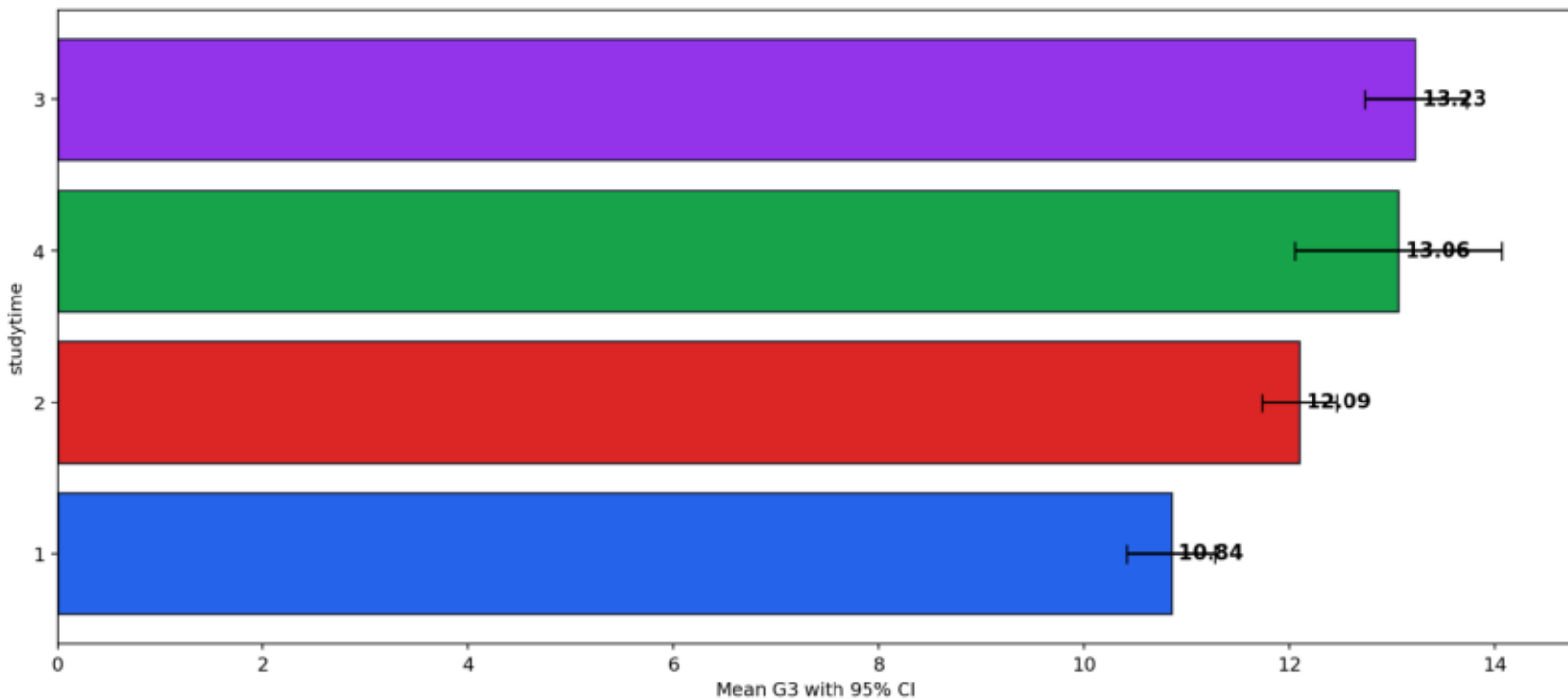
group	n	mean	standard_deviation	variance	standard_error	minimum	maximum	mean_ci95_lower	mean_ci95_upper
1	212	10.844340	3.218624	10.359541	0.221056	0	18	10.411070	11.277609
2	305	12.091803	3.243125	10.517860	0.185701	0	19	11.727830	12.455777
3	97	13.226804	2.502104	6.260524	0.254050	8	18	12.728866	13.724742
4	35	13.057143	3.038410	9.231933	0.513585	6	19	12.050516	14.063769

Sidak pairwise results:

comparison	mean_difference_group_1_minus_group_2	p_unadjusted	p_sidak_adjusted	significant_sidak_alpha_0_05	decision
1 vs 3	-2.382465	8.952929e-10	5.371757e-09	Yes	Reject equal means
1 vs 2	-1.247464	9.473280e-06	5.683834e-05	Yes	Reject equal means
1 vs 4	-2.212803	1.146236e-04	6.875444e-04	Yes	Reject equal means
2 vs 3	-1.135001	1.914916e-03	1.143463e-02	Yes	Reject equal means
2 vs 4	-0.965340	8.393031e-02	4.090223e-01	No	Fail to reject equal means
3 vs 4	0.169661	7.831343e-01	9.998960e-01	No	Fail to reject equal means

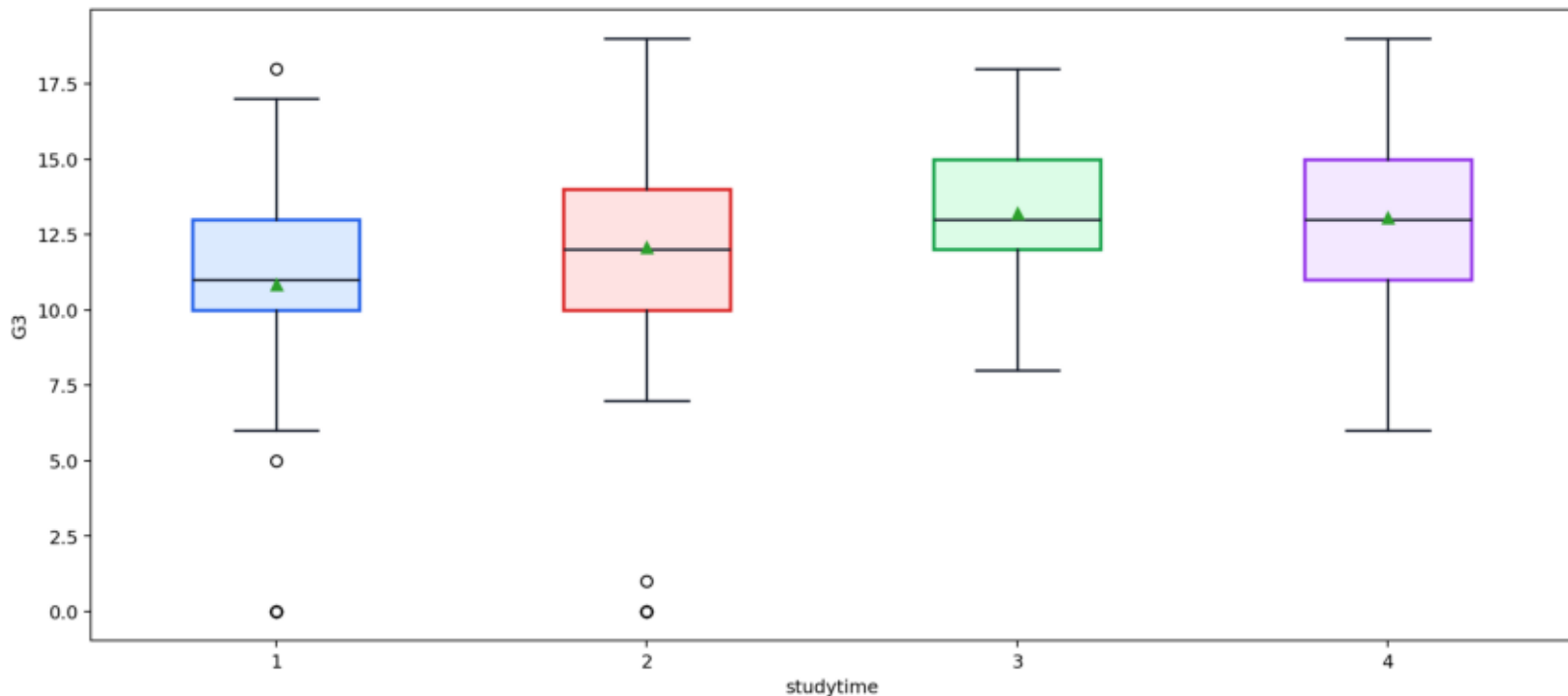
# Sidak Correction: Colorful Group Means

Group means are shown before Sidak-adjusted pairwise testing.



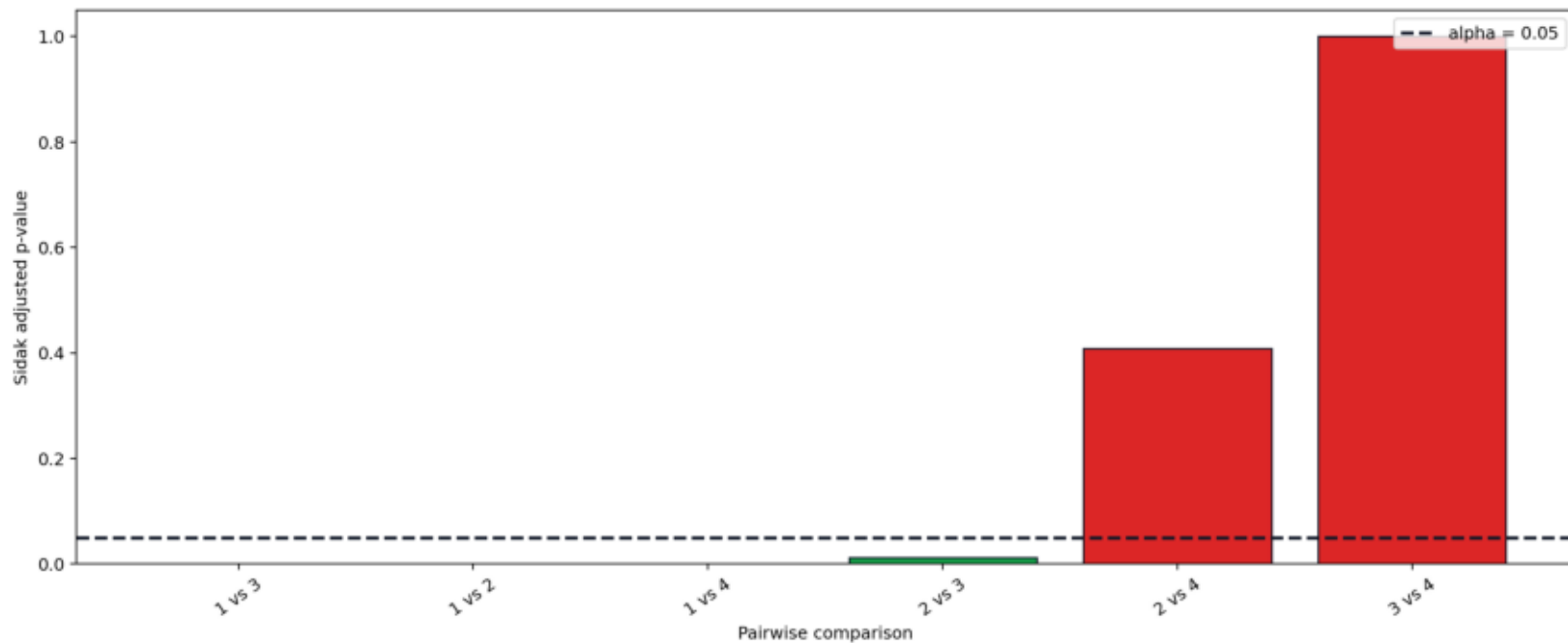
# Sidak Correction: Colorful Group Distributions

Boxplots help check spread, outliers, and group overlap before post-hoc comparison.



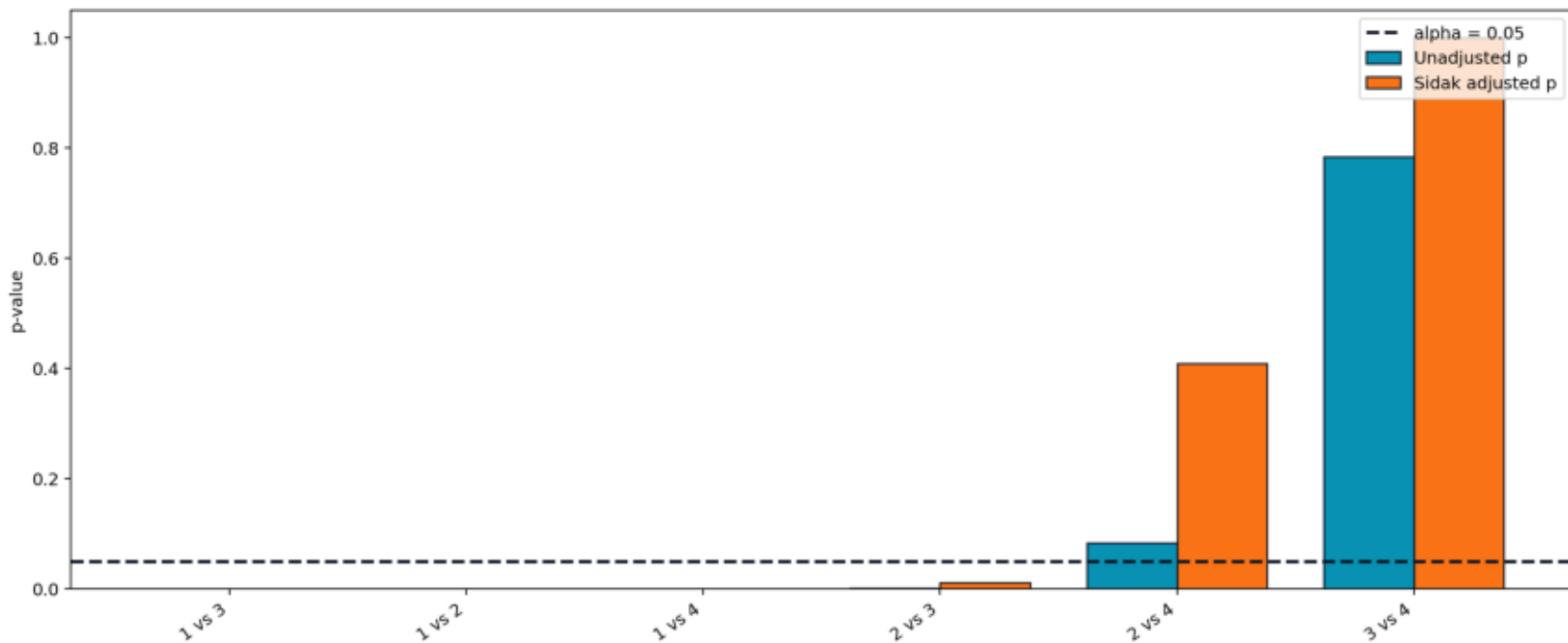
# Sidak Correction: Adjusted p-values

Green bars are significant after Sidak familywise-error correction.



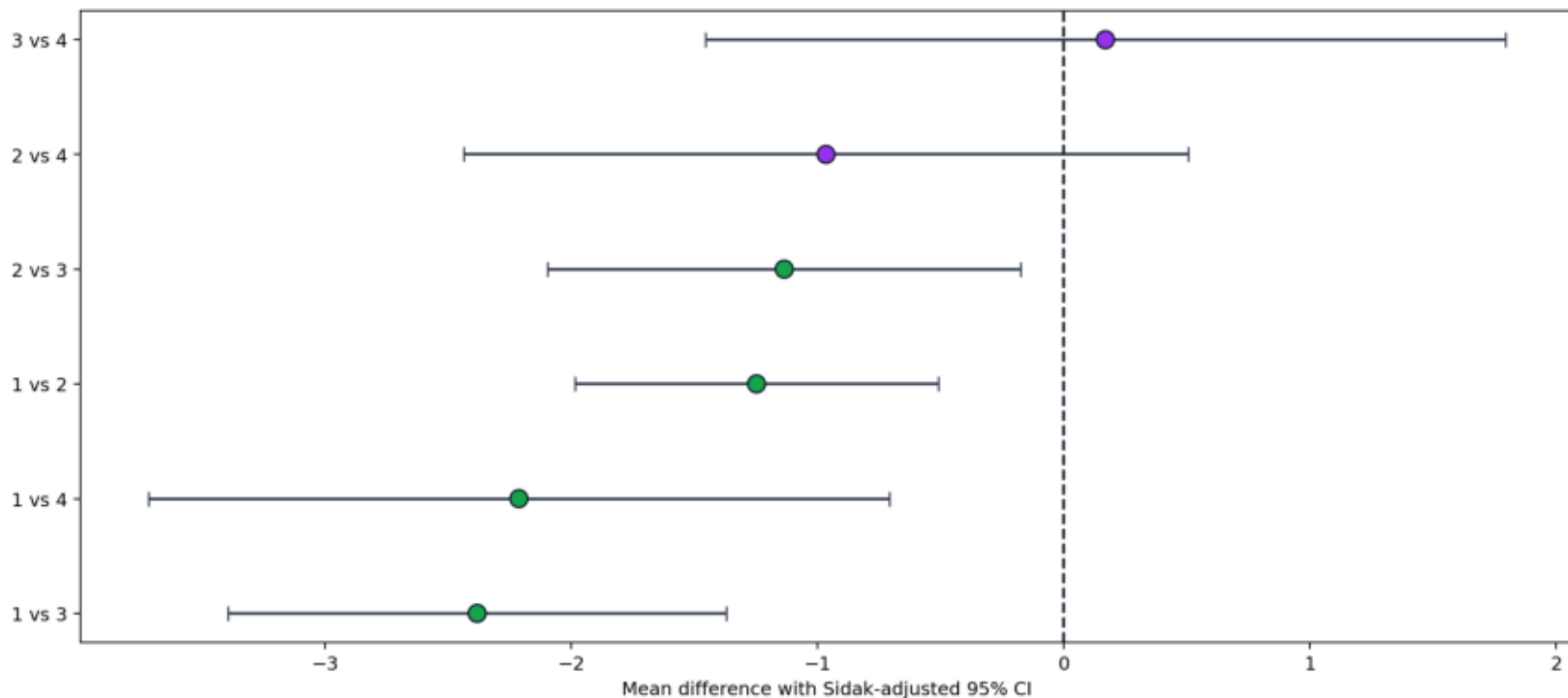
# Sidak Correction: Raw vs Adjusted p-values

The Sidak adjustment increases p-values to protect against multiple testing.



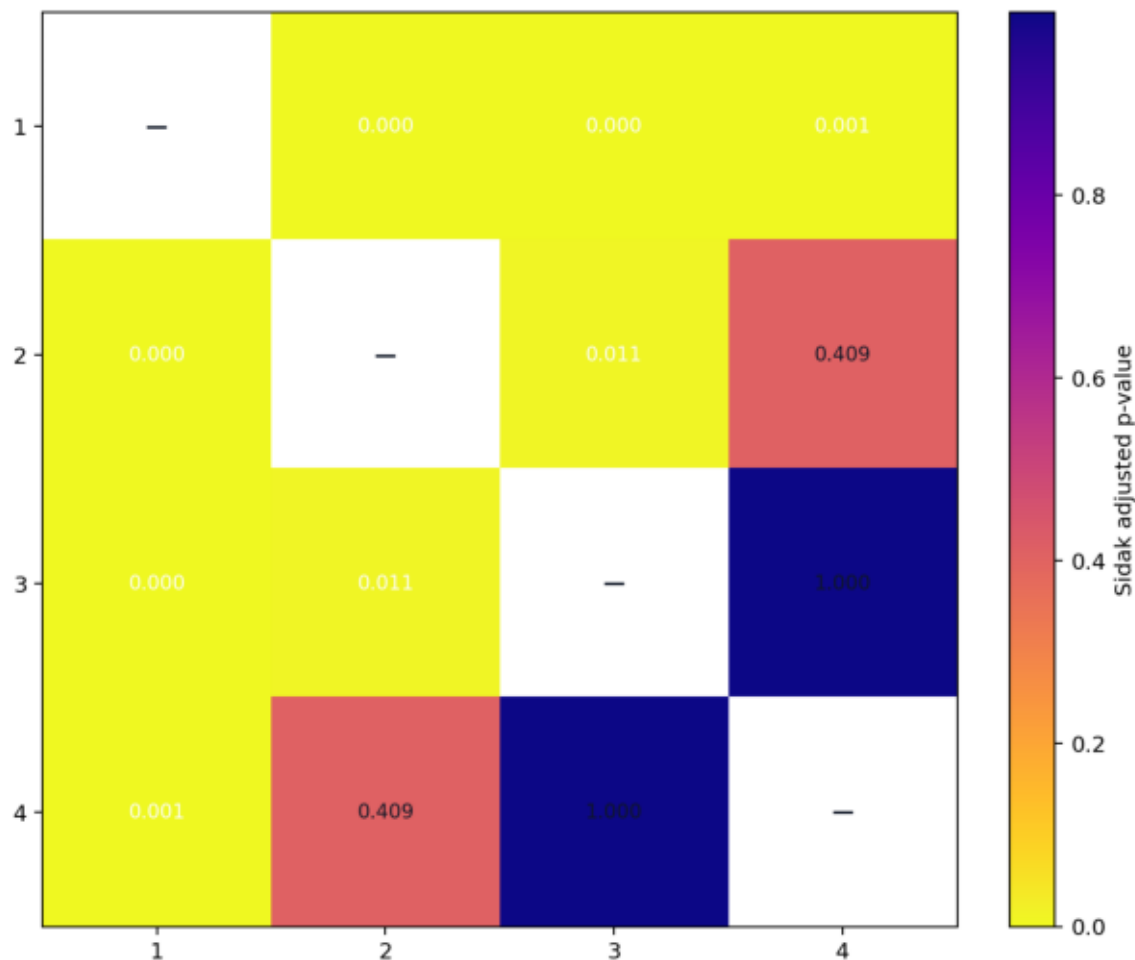
# Sidak Correction: Pairwise Mean Differences

Intervals crossing zero indicate non-significant pairwise differences after correction.



# Sidak Correction: Adjusted p-value Heatmap

Smaller adjusted p-values identify stronger between-group differences.



# Sidak Correction: Group Size and Spread

Sample size and spread affect the standard error of each pairwise comparison.

