

Fishers LSD Test Post Hoc Analysis

Purpose: compare all pairs of group means using the pooled ANOVA error term.
H0 for each pair: the two group means are equal.
H1 for each pair: the two group means are different.

Analysis summary:

analysis	target_variable	group_variable	number_of_groups	number_of_pairwise_comparisons
Fishers LSD post hoc analysis	G3	studytime	4	6
alpha	anova_p_value	anova_decision_alpha_0_05	significant_olsd_pairs	
0.05	5.705728e-10	Reject equal group means	4	

important_note

Fishers LSD does not strongly control familywise error; use it for planned comparisons or after a significant omnibus ANOVA.

One-way ANOVA:

source	sum_of_squares	df	mean_square	f_value	p_value
Between groups	465.0778	3	155.025942	15.87627	5.705728e-10
Within groups	6298.1887	645	9.764634	NA	NA
Total	6763.2666	648	NA	NA	NA

Group summary:

group	n	mean	standard_deviation	variance	standard_error	minimum	maximum	mean_ci95_lower	mean_ci95_upper
1	212	10.84434	3.218624	10.359541	0.2210560	0	18	10.41107	11.27761
2	305	12.09180	3.243125	10.517860	0.1857008	0	19	11.72783	12.45578
3	97	13.22680	2.502104	6.260524	0.2540502	8	18	12.72887	13.72474
4	35	13.05714	3.038410	9.231933	0.5135850	6	19	12.05052	14.06377

Fisher LSD pairwise comparisons:

group_1	group_2	mean_group_1	mean_group_2	mean_difference_group_1_minus_group_2	standard_error	t_value
1	3	10.84434	13.22680	-2.3824645	0.3830482	-6.2197513
1	2	10.84434	12.09180	-1.2474637	0.2794187	-4.4644967
1	4	10.84434	13.05714	-2.2128032	0.5701308	-3.8812203
2	3	12.09180	13.22680	-1.1350008	0.3642547	-3.1159535
2	4	12.09180	13.05714	-0.9653396	0.5576780	-1.7309982
3	4	13.22680	13.05714	0.1696613	0.6161622	0.2753516

df_error	fisher_olsd_p_value	lsd_critical_difference	lsd_ci95_lower	lsd_ci95_upper	alpha
645	8.952929e-10	0.7521721	-3.134637	-1.6302924	0.05
645	9.473280e-06	0.5486801	-1.796144	-0.6987836	0.05
645	1.146236e-04	1.1195366	-3.332340	-1.0932666	0.05
645	1.914916e-03	0.7152684	-1.850269	-0.4197325	0.05
645	8.393031e-02	1.0950836	-2.060423	0.1297441	0.05
645	7.831343e-01	1.2099261	-1.040265	1.3795874	0.05

decision_alpha_0_05

Significant by Fishers LSD

Significant by Fishers LSD

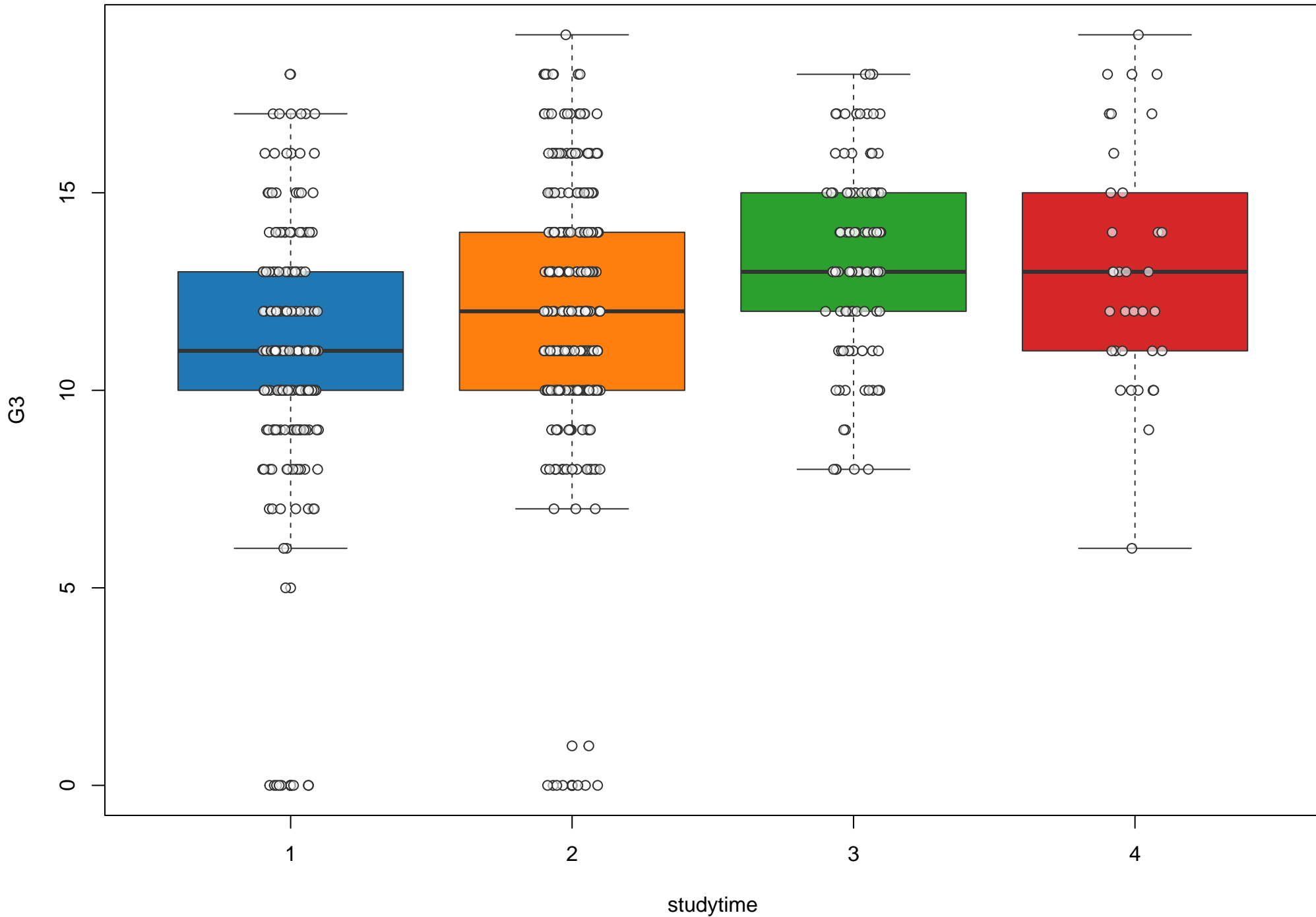
Significant by Fishers LSD

Significant by Fishers LSD

Not significant by Fishers LSD

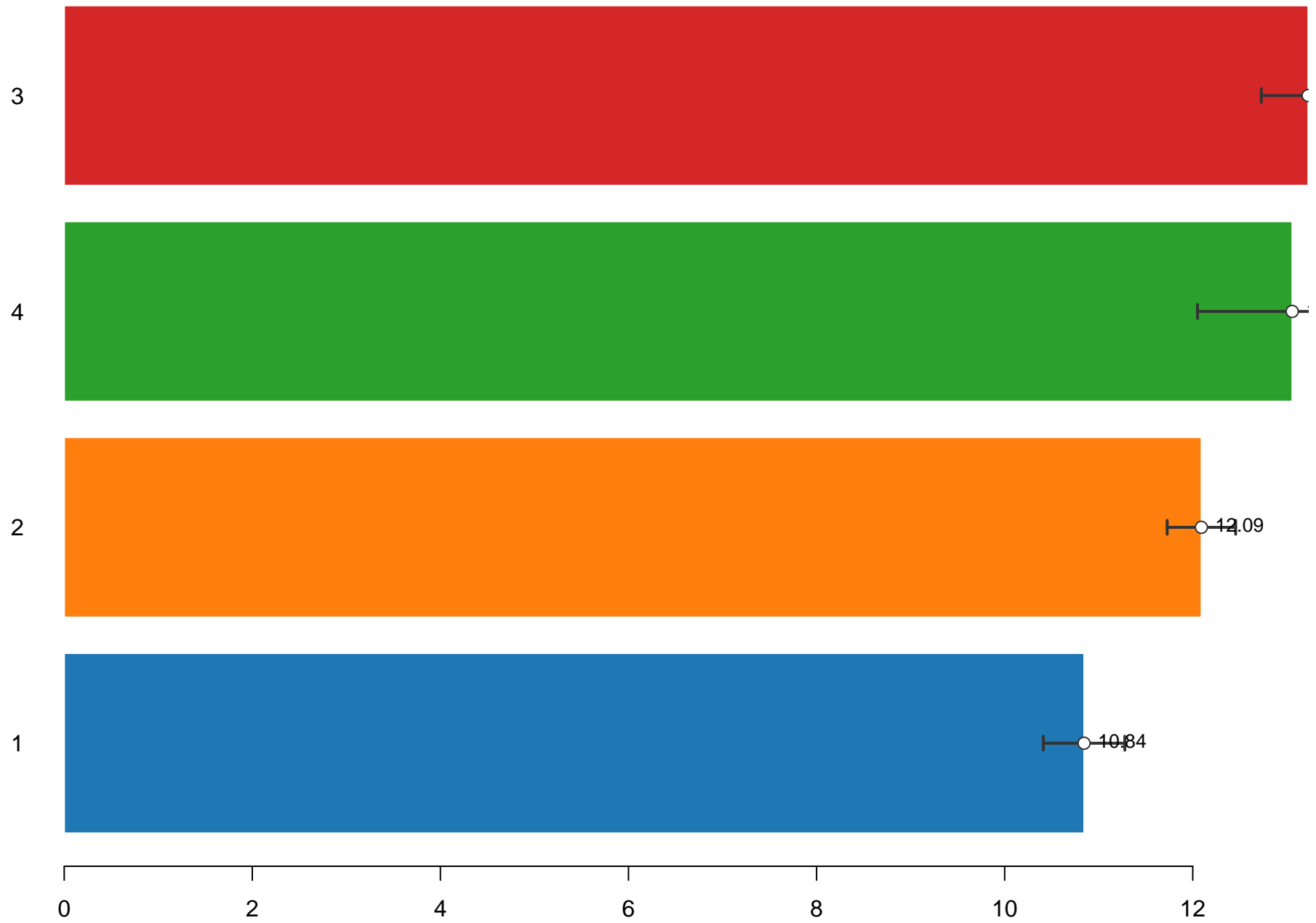
Not significant by Fishers LSD

Fishers LSD Test: Colorful Group Distributions



Colorful boxplots show score distributions before LSD pairwise mean comparisons.

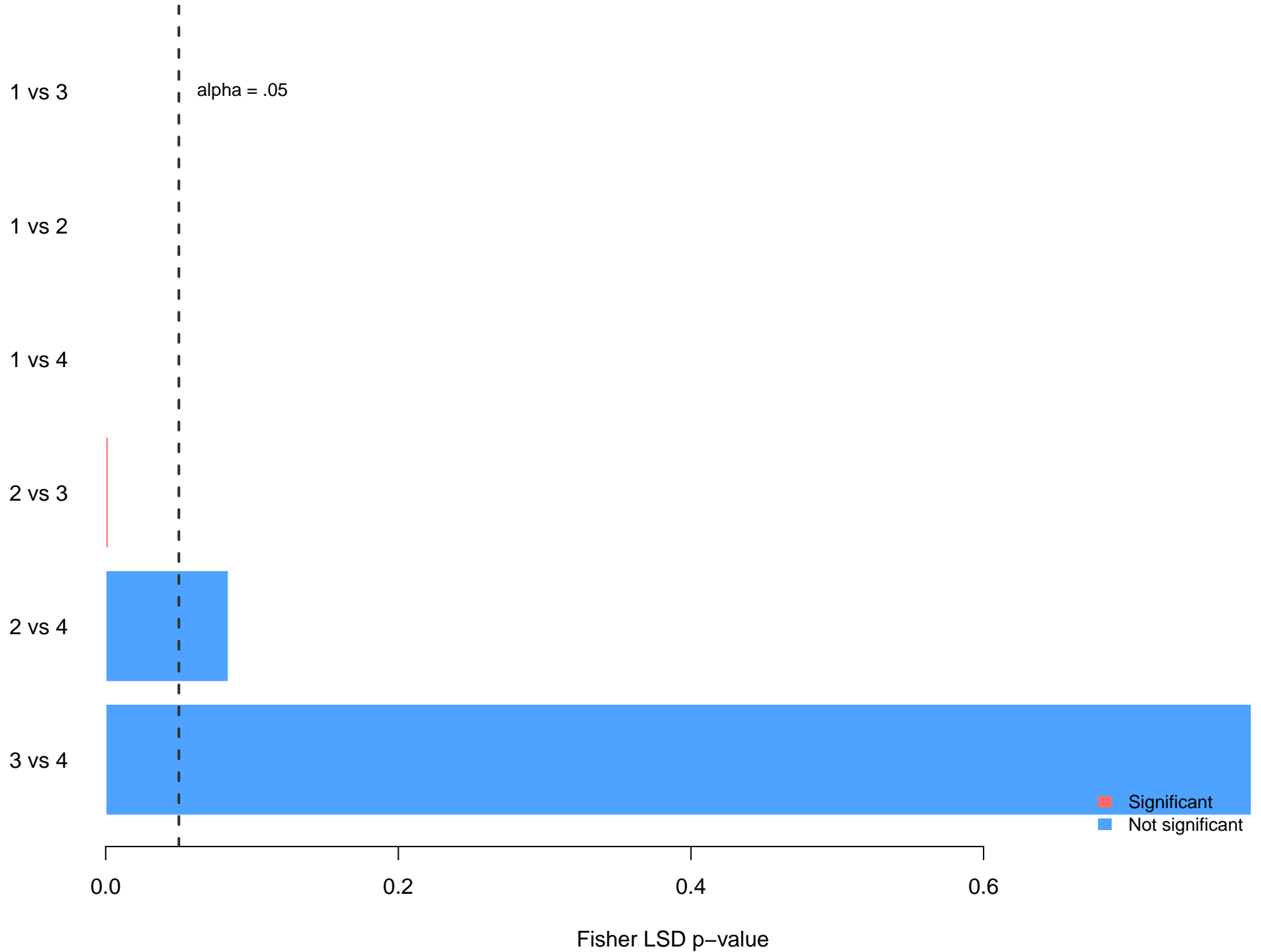
Fishers LSD Test: Colorful Group Means



Mean G3 with approximate 95% CI

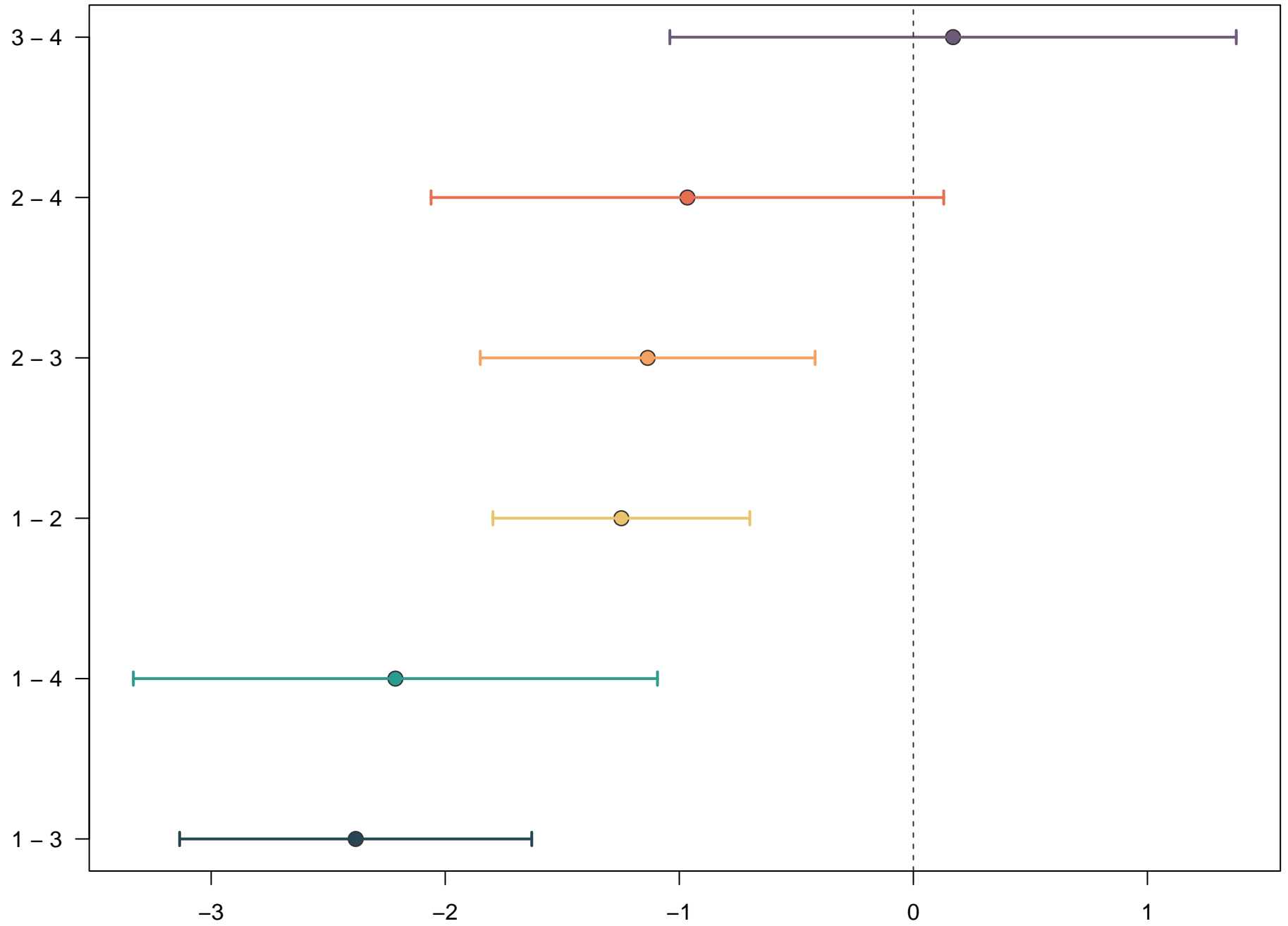
LSD comparisons test which group means differ using pooled ANOVA error.

Fishers LSD Test: Colorful p-values



Red bars are significant by Fisher's LSD: blue bars are not significant.

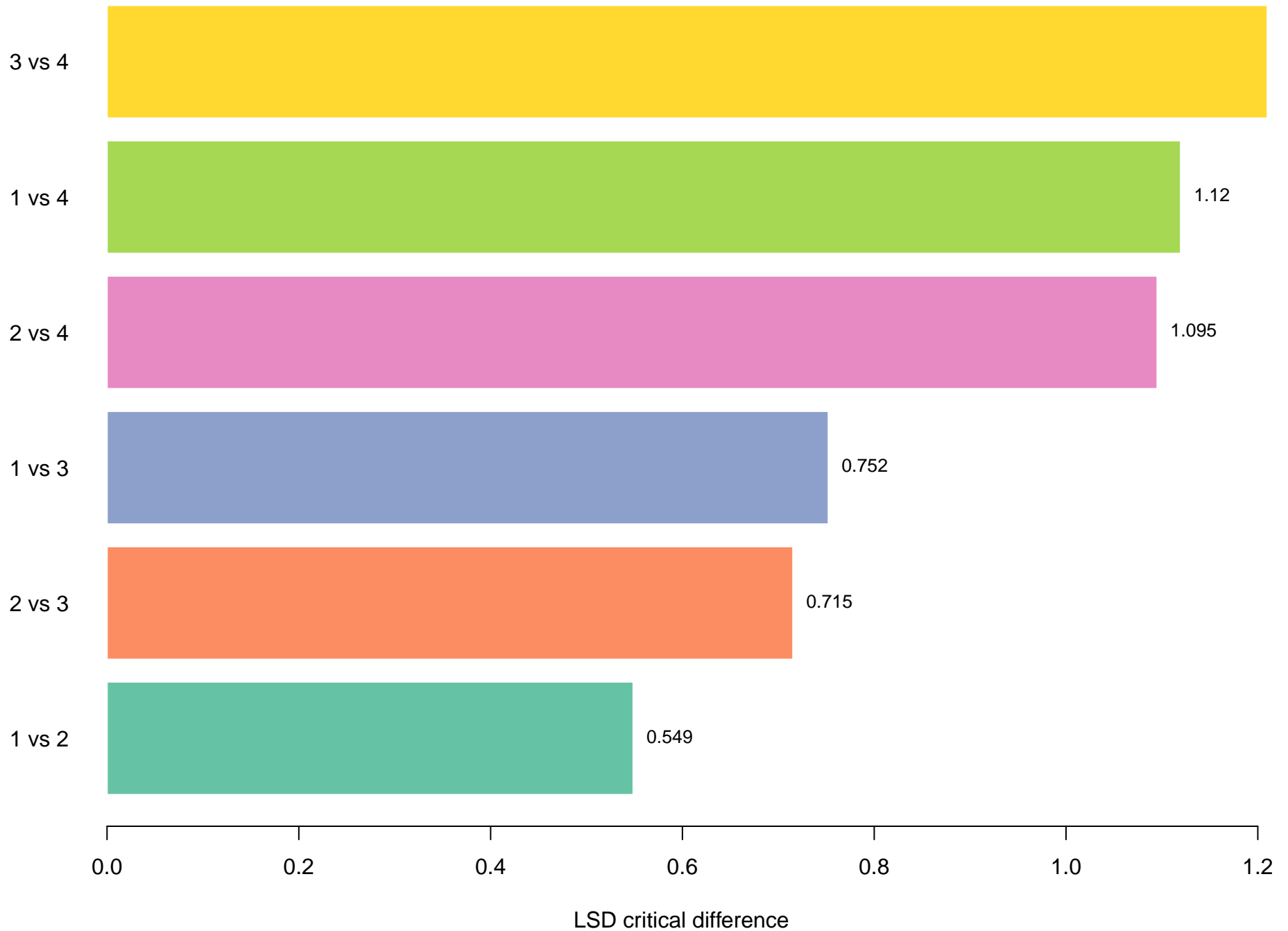
Fishers LSD Test: Colorful Mean Differences



Mean difference with Fisher LSD 95% CI

Intervals that do not cross zero indicate significant LSD pairwise differences.

Fishers LSD Test: Colorful Critical Difference by Pair



A pair is significant when the absolute mean difference is larger than this LSD value.