

Contrast Analysis / Planned Comparisons – R Report

H0 for each contrast: the weighted mean contrast equals zero.
H1 for each contrast: the weighted mean contrast is different from zero.

Summary:

analysis	target_variable	group_variable	number_of_groups	total_n	anova_p_value	important_note
Contrast analysis / planned comparisons	G3	studytime	4	649	5.705728e-10	
anova_decision_alpha_0_05	number_of_planned_contrasts	significant_planned_contrasts_alpha_0_05				
Reject equal group means	4		3			

Planned contrasts should be chosen before looking at results; use correction when many exploratory contrasts are tested.

ANOVA context:

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

Contrast results:

contrast_name	contrast_estimate	standard_error	t_value	df_error	p_value	ci95_lower
First group vs all later groups	-5.842731	0.9089595	-6.427934	645	2.516362e-10	-7.6276086
Lower groups vs higher groups	3.347804	0.6765579	4.948289	645	9.565401e-07	2.0192819
Linear trend across ordered groups	7.773411	1.7487492	4.445126	645	1.034036e-05	4.3394815
Last group vs all earlier groups	3.008482	1.6400143	1.834424	645	6.705154e-02	-0.2119304

ci95_upper alpha decision_alpha_0_05

-4.057854	0.05	Significant planned contrast
4.676326	0.05	Significant planned contrast
11.207340	0.05	Significant planned contrast
6.228894	0.05	Not significant planned contrast

interpretation_note
Compares the first/lowest factor level against all later levels.
Compares the lower half of groups against the higher half of groups.
Tests whether the dependent variable rises or falls steadily across ordered factor levels.
Compares the last/highest factor level against all earlier levels.

Contrast coefficients:

contrast_name	interpretation_note
Linear trend across ordered groups	Tests whether the dependent variable rises or falls steadily across ordered factor levels.
Lower groups vs higher groups	Compares the lower half of groups against the higher half of groups.
First group vs all later groups	Compares the first/lowest factor level against all later levels.
Last group vs all earlier groups	Compares the last/highest factor level against all earlier levels.

coefficient_for_group_1	coefficient_for_group_2	coefficient_for_group_3	coefficient_for_group_4
-3	-1	1	3
-1	-1	1	1
3	-1	-1	-1
-1	-1	-1	3

Colorful chart files created by this R script

PNG charts saved in:

D:/DATA ANALYSIS/F Post Hoc Tests/Contrast Analysis/R_Output/charts

chart_01_group_distribution_boxplots.png
chart_02_group_mean_profile.png
chart_03_planned_contrast_coefficients.png
chart_04_contrast_estimates_with_ci.png
chart_05_contrast_p_value_decision.png