

GraphPad Prism v7

Three way ANOVA

Prism has been able to perform one- and two-way ANOVA for many versions, and now can also perform three-way ANOVA.

Enter your data on a grouped table like this.

Table format: Grouped		Group A			Group B			Group C			Group D		
		Low fat Male			Low fat Female			High fat Male			High fat Female		
		A:Y1	A:Y2	A:Y3	B:Y1	B:Y2	B:Y3	C:Y1	C:Y2	C:Y3	D:Y1	D:Y2	D:Y3
1	Light smoker	24.1	29.2	24.6	20.0	21.9	17.6	14.6	15.3	12.3	16.1	9.3	10.8
2	Heavy smoker	17.6	18.8	23.2	14.8	10.3	11.3	14.9	20.4	12.8	10.1	14.4	6.1

Two of the factors must have only two levels (e.g. male/female; low fat/high fat), but the the third factor (designated by different rows) can have more levels (more than two rows).

The three-way ANOVA dialog is similar to the dialog for one- and two-way ANOVA, but the choices for multiple comparison goal are a bit different:

Parameters: Three-Way ANOVA

Data Arrangement Multiple Comparisons Options Consolidate Data

How many comparisons?

- ☒ No multiple comparison test.
- ☐ Compare each cell mean with every other cell mean
- ☐ Compare the control mean (A1) with the other cell means
- ☐ Compare means of cells that differ by only one factor
- ☐ Compare each cell mean in row 1 with the cell mean just below

Here is a portion of the results table, showing all seven P values. Yes, seven! Three-way ANOVA is complicated.

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Gender	70.38	1	70.38	F (1, 1) = 7.539	P=0.0144
Treatment	242.6	1	242.6	F (1, 1) = 25.98	P=0.0001
Dose	176.6	1	176.6	F (1, 1) = 18.92	P=0.0005
Gender x Treatment	72.45	1	72.45	F (1, 1) = 7.761	P=0.0132
Gender x Dose	11.07	1	11.07	F (1, 1) = 1.186	P=0.2923
Treatment x Dose	13.65	1	13.65	F (1, 1) = 1.462	P=0.2441
Gender x Treatment x Dose	1.87	1	1.87	F (1, 1) = 0.2004	P=0.6604
Residual	149.4	16	9.335		

Prism 7 provides a new kind of three-way graph to display data entered into three-way ANOVA:

