

Two or Three Way Fixed ANOVA with 1 Case Per Cell

There are times when one has very limited ability to sample subjects but never the less would like to examine the effects of two or even three fixed factors on subjects. If there is only one subject for each combination of the factors, the within cell variance cannot be obtained and therefore the residual cannot be obtained by pooling the within cell variance. As an alternative, the residual can be estimated as simply the difference between the total variance across all subjects and the variances due to the factors. The interaction among factors cannot be estimated. Shown below is the dialog for this design:

OneCaseAnovaForm

Variables:

Dependent: Y

Factor 1: Chip

Factor 2 Variable: Probe

Factor 3 Clark:

Post-Hoc Comparisons:

- ☒ ScheffeChk
- ☐ Tukey HSD (= n's)
- ☐ Tukey B (= n's)
- ☐ Tukey-Kramer
- ☐ Newman-Keuls (= n's)

Options:

- ☒ Plot Means Using 3D bars
- ☐ Plot Means Using 2D bars
- ☐ Plot Means Horizontally (3D)

Alpha Level for Overall Tests: 0.05

Alpha Level for Post-Hoc Tests: 0.05

☒ Get Interactions

Help Reset Cancel Compute Return

We have used the sample file labeled “GeneChips.LAZ” for our analysis. The results obtained are:

Two Way Analysis of Variance

Variable analyzed: Y

Factor A (rows) variable: Chip

Factor B (columns) variable: Probe

SOURCE	D.F.	SS	MS	F	PROB.> F	Omega Squared
Among Rows	3	59.750	19.917	3.886	0.037	0.077
Among Columns	4	451.700	112.925	22.034	0.000	0.746
Residual	12	61.500	5.125			
NonAdditivity	1	4.160	4.160	0.798	0.391	
Balance	11	57.340	5.213			
Total	19	572.950	30.155			

Omega squared for combined effects = 0.823

Descriptive Statistics

GROUP	Row	Col.	N	MEAN	VARIANCE	STD.DEV.
Cell	1	1	1	18.000	0.000	0.000
Cell	1	2	1	11.000	0.000	0.000
Cell	1	3	1	8.000	0.000	0.000
Cell	1	4	1	21.000	0.000	0.000
Cell	1	5	1	4.000	0.000	0.000
Cell	2	1	1	13.000	0.000	0.000
Cell	2	2	1	7.000	0.000	0.000
Cell	2	3	1	5.000	0.000	0.000
Cell	2	4	1	16.000	0.000	0.000
Cell	2	5	1	7.000	0.000	0.000
Cell	3	1	1	15.000	0.000	0.000
Cell	3	2	1	6.000	0.000	0.000
Cell	3	3	1	7.000	0.000	0.000
Cell	3	4	1	16.000	0.000	0.000
Cell	3	5	1	6.000	0.000	0.000
Cell	4	1	1	19.000	0.000	0.000
Cell	4	2	1	15.000	0.000	0.000
Cell	4	3	1	12.000	0.000	0.000
Cell	4	4	1	18.000	0.000	0.000
Cell	4	5	1	5.000	0.000	0.000
Row	1		5	12.400	49.300	7.021
Row	2		5	9.600	21.800	4.669
Row	3		5	10.000	25.500	5.050
Row	4		5	13.800	31.700	5.630
Col	1		4	16.250	7.583	2.754
Col	2		4	9.750	16.917	4.113
Col	3		4	8.000	8.667	2.944
Col	4		4	17.750	5.583	2.363
Col	5		4	5.500	1.667	1.291
TOTAL			20	11.450	30.155	5.491

COMPARISONS AMONG ROWS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1	2	2.80	1.96	3.079	NO
1	3	2.40	1.68	3.079	NO
1	4	-1.40	0.98	3.079	NO
2	3	-0.40	0.28	3.079	NO
2	4	-4.20	2.93	3.079	NO
3	4	-3.80	2.65	3.079	NO

COMPARISONS AMONG COLUMNS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1	2	6.50	4.06	3.444	YES
1	3	8.25	5.15	3.444	YES
1	4	-1.50	0.94	3.444	NO
1	5	10.75	6.72	3.444	YES
2	3	1.75	1.09	3.444	NO
2	4	-8.00	5.00	3.444	YES
2	5	4.25	2.65	3.444	NO
3	4	-9.75	6.09	3.444	YES
3	5	2.50	1.56	3.444	NO
4	5	12.25	7.65	3.444	YES

COMPARISONS AMONG COLUMNS WITHIN EACH ROW

ROW 1 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1	2	7.00	2.19	3.444	NO
1	3	10.00	3.12	3.444	NO
1	4	-3.00	0.94	3.444	NO
1	5	14.00	4.37	3.444	YES
2	3	3.00	0.94	3.444	NO
2	4	-10.00	3.12	3.444	NO
2	5	7.00	2.19	3.444	NO
3	4	-13.00	4.06	3.444	YES
3	5	4.00	1.25	3.444	NO
4	5	17.00	5.31	3.444	YES

ROW 2 COMPARISONS

Scheffe contrasts among pairs of means.					
alpha selected = 0.05					
Group vs Group	Difference	Scheffe	Critical	Significant?	
		Statistic	Value		

1	2	6.00	1.87	3.444	NO
1	3	8.00	2.50	3.444	NO
1	4	-3.00	0.94	3.444	NO
1	5	6.00	1.87	3.444	NO
2	3	2.00	0.62	3.444	NO
2	4	-9.00	2.81	3.444	NO
2	5	0.00	0.00	3.444	NO
3	4	-11.00	3.44	3.444	NO
3	5	-2.00	0.62	3.444	NO

4	5	9.00	2.81	3.444	NO
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ROW 3 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1	2	9.00	2.81	3.444	NO
1	3	8.00	2.50	3.444	NO
1	4	-1.00	0.31	3.444	NO
1	5	9.00	2.81	3.444	NO
2	3	-1.00	0.31	3.444	NO
2	4	-10.00	3.12	3.444	NO
2	5	0.00	0.00	3.444	NO
3	4	-9.00	2.81	3.444	NO
3	5	1.00	0.31	3.444	NO
4	5	10.00	3.12	3.444	NO

ROW 4 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1	2	4.00	1.25	3.444	NO
1	3	7.00	2.19	3.444	NO
1	4	1.00	0.31	3.444	NO
1	5	14.00	4.37	3.444	YES
2	3	3.00	0.94	3.444	NO
2	4	-3.00	0.94	3.444	NO
2	5	10.00	3.12	3.444	NO
3	4	-6.00	1.87	3.444	NO
3	5	7.00	2.19	3.444	NO
4	5	13.00	4.06	3.444	YES

COMPARISONS AMONG ROWS WITHIN EACH COLUMN

COLUMN 1 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1	2	5.00	1.56	3.079	NO
1	3	3.00	0.94	3.079	NO
1	4	-1.00	0.31	3.079	NO
2	3	-2.00	0.62	3.079	NO

2	4	-6.00	1.87	3.079	NO
3	4	-4.00	1.25	3.079	NO

COLUMN 2 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1 2	4.00	1.25	3.079	NO	
1 3	5.00	1.56	3.079	NO	
1 4	-4.00	1.25	3.079	NO	
2 3	1.00	0.31	3.079	NO	
2 4	-8.00	2.50	3.079	NO	
3 4	-9.00	2.81	3.079	NO	

COLUMN 3 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1 2	3.00	0.94	3.079	NO	
1 3	1.00	0.31	3.079	NO	
1 4	-4.00	1.25	3.079	NO	
2 3	-2.00	0.62	3.079	NO	
2 4	-7.00	2.19	3.079	NO	
3 4	-5.00	1.56	3.079	NO	

COLUMN 4 COMPARISONS

Scheffe contrasts among pairs of means. alpha selected = 0.05					
Group vs Group	Difference	Scheffe Statistic	Critical Value	Significant?	
1 2	5.00	1.56	3.079	NO	
1 3	5.00	1.56	3.079	NO	
1 4	3.00	0.94	3.079	NO	
2 3	0.00	0.00	3.079	NO	
2 4	-2.00	0.62	3.079	NO	
3 4	-2.00	0.62	3.079	NO	

COLUMN 5 COMPARISONS

Scheffe contrasts among pairs of means.
alpha selected = 0.05

Group	vs Group	Difference	Scheffe Statistic	Critical Value	Significant?
1	2	-3.00	0.94	3.079	NO
1	3	-2.00	0.62	3.079	NO
1	4	-1.00	0.31	3.079	NO
2	3	1.00	0.31	3.079	NO
2	4	2.00	0.62	3.079	NO
3	4	1.00	0.31	3.079	NO



