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data one;
input id y group;
if group = 1 then school = 1;if group = 1 then emph = 1;if group = 1 then v=1.0;
if group = 2 then school = -1;if group = 2 then emph = 1;if group = 2 then v=2.5;
if group = 3 then school = 1;if group = 3 then emph = -1;if group = 3 then v=0.5;
if group = 4 then school = -1;if group = 4 then emph = -1;if group = 4 then v=1.0;
int=school*emph;w=1/v;
cards;
1 2 1
2 3 1
3 2 1
4 4 1
5 4 1
6 5 2
7 6 2
8 7 2
9 4 2
10 8 2
11 10 3
12 9 3
13 9 3
14 8 3
15 9 3
16 5 4
17 7 4
18 6 4
19 7 4
20 5 4
;
proc glm;class group;
model y = group;
means group / tukey sidak welch;
contrast 'Emphasis Main Effect' group -1 -1 1 1;
contrast ' School Main Effect' group -1 1 -1 1;
contrast ' Interaction Effect' group 1 -1 -1 1;
run;
proc glm;class school emph;
model y = emph school emph*school;
means emph*school;run;
proc reg;
model y =school emph int / tol scorrl scorr2;run;

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proc glm;class group;
model y = group;means group;weight w;run;
proc glm;class school emph;
model y = emph school emph*school;
means emph*school;weight w; run;
proc reg;
model y =school emph int / tol scorrl scorr2;
weight w;run;

```


Sidak t Tests for y

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	16
Error Mean Square	1.25
Critical Value of t	2.99814
Minimum Significant Difference	2.12

Means with the same letter are not significantly different.

Sidak Grouping	Mean	N	group
A	9.0000	5	3
B	6.0000	5	2
B	6.0000	5	4
C	3.0000	5	1

Dependent Variable: y

Contrast	DF	Contrast SS	Mean Square	F Value	Pr > F
Emphasis Main Effect	1	45.00000000	45.00000000	36.00	<.0001
School Main Effect	1	0.00000000	0.00000000	0.00	1.0000
Interaction Effect	1	45.00000000	45.00000000	36.00	<.0001

The GLM Procedure

Class Level Information
 Class Levels Values

school 2 -1 1
 emph 2 -1 1

Number of Observations Read 20
 Number of Observations Used 20

Dependent Variable: y

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	90.0000000	30.0000000	24.00	<.0001
Error	16	20.0000000	1.2500000		
Corrected Total	19	110.0000000			

R-Square 0.818182
 Coeff Var 18.63390
 Root MSE 1.118034
 y Mean 6.000000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
emph	1	45.0000000	45.0000000	36.00	<.0001
school	1	0.0000000	0.0000000	0.00	1.0000
emph*school	1	45.0000000	45.0000000	36.00	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
emph	1	45.0000000	45.0000000	36.00	<.0001
school	1	0.0000000	0.0000000	0.00	1.0000
emph*school	1	45.0000000	45.0000000	36.00	<.0001

Level of emph	Level of school	N	Mean	Std Dev
1	1	5	3.00000000	1.00000000
1	-1	5	6.00000000	1.58113883
-1	1	5	9.00000000	0.70710678
-1	-1	5	6.00000000	1.00000000

4 Variables: The CORR Procedure
y school emph int

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
y	20	6.00000	2.40613	120.00000	2.00000	10.00000
school	20	0	1.02598	0	-1.00000	1.00000
emph	20	0	1.02598	0	-1.00000	1.00000
int	20	0	1.02598	0	-1.00000	1.00000

Pearson Correlation Coefficients, N = 20
Prob > |r| under H0: Rho=0

	y	school	emph	int
y	1.00000	0.00000	-0.63960	-0.63960
school		1.00000	0.0024	0.0024
emph			1.00000	0.00000
int				1.00000

The REG Procedure
 Model: MODEL1
 Dependent Variable: y

Number of Observations Read 20
 Number of Observations Used 20

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	90.00000	30.00000	24.00	<.0001
Error	16	20.00000	1.25000		
Corrected Total	19	110.00000			

Root MSE 1.11803 R-Square 0.8182
 Dependent Mean 6.00000 Adj R-Sq 0.7841
 Coeff Var 18.63390

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t	Squared Semi-partial Corr Type I	Squared Semi-partial Corr Type II	Tolerance
Intercept	1	6.00000	0.25000	24.00	<.0001	.	.	.
school	1	0	0.25000	0.00	1.0000	0	0	1.00000
emph	1	-1.50000	0.25000	-6.00	<.0001	0.40909	0.40909	1.00000
int	1	-1.50000	0.25000	-6.00	<.0001	0.40909	0.40909	1.00000

The GLM Procedure
 Class Level Information
 Class Levels Values
 group 4 1 2 3 4

Number of Observations Read 20
 Number of Observations Used 20

Dependent Variable: y
 Weight: w

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	124.7727273	41.5909091	41.59	<.0001
Error	16	16.0000000	1.0000000		
Corrected Total	19	140.7727273			

R-Square	Coeff Var	Root MSE	y Mean
0.886342	14.96599	1.000000	6.681818

The GLM Procedure

Level of group	N	Sum of Weights	-----y----- Mean	Std Dev
1	5	5	3.00000000	1.00000000
2	5	2	6.00000000	1.00000000
3	5	10	9.00000000	1.00000000
4	5	5	6.00000000	1.00000000

The GLM Procedure
 Class Level Information
 Class Levels Values

school 2 -1 1
 emph 2 -1 1

Number of Observations Read 20
 Number of Observations Used 20

Dependent Variable: y
 Weight: w

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	124.7727273	41.5909091	41.59	<.0001
Error	16	16.0000000	1.0000000		
Corrected Total	19	140.7727273			

R-Square 0.886342
 Coeff Var 14.96599
 Root MSE 1.00000
 y Mean 6.681818

Source	DF	Type I SS	Mean Square	F Value	Pr > F
emph	1	81.91558442	81.91558442	81.92	<.0001
school	1	6.85714286	6.85714286	6.86	0.0186
school*emph	1	36.00000000	36.00000000	36.00	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
emph	1	36.00000000	36.00000000	36.00	<.0001
school	1	0.00000000	0.00000000	0.00	1.0000
school*emph	1	36.00000000	36.00000000	36.00	<.0001

The GLM Procedure

Level of school	Level of emph	N	Sum of Weights	-----y----- Mean	Std Dev
-1	-1	5	5	6.00000000	1.00000000
-1	1	5	2	6.00000000	1.00000000
1	-1	5	10	9.00000000	1.00000000
1	1	5	5	3.00000000	1.00000000

The REG Procedure
 Model: MODEL1
 Dependent Variable: y

Number of Observations Read 20
 Number of Observations Used 20

Weight: w

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	124.77273	41.59091	41.59	<.0001
Error	16	16.00000	1.00000		
Corrected Total	19	140.77273			

Root MSE 1.00000 R-Square 0.8863
 Dependent Mean 6.68182 Adj R-Sq 0.8650
 Coeff Var 14.96599

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t	Squared Semi-partial Corr Type I	Squared Semi-partial Corr Type II	Tolerance
Intercept	1	6.00000	0.25000	24.00	<.0001	.	.	.
school	1	1.33248E-16	0.25000	0.00	1.0000	0.03390	2.01802E-33	0.83810
emph	1	-1.50000	0.25000	-6.00	<.0001	0.59671	0.25573	0.83810
int	1	-1.50000	0.25000	-6.00	<.0001	0.25573	0.25573	0.73333