

# Chapter 16 Problems

1. a. Omnibus analysis (from SPSS output except for Total):

Source	SS	df	MS	F
A	16.095	a-1=2	8.048	3.634 ( $p > .05; F_{crit} = 3.89$ )
S	10.286	s-1=6	1.714	
AxS	26.571	(a-1)(s-1)=12	2.214	
Total	52.952	as-1=20		

Wk. Subject	Scores			$\Psi_1(1,-1,0)$		$\Psi_2(1,1,-2)$	
	Praise	Reproof	None	Diff	SS <sub>w</sub>	Diff	SS <sub>w</sub>
1	4	7	7	-3	4.5	-3	1.5000
2	7	6	3	1	0.5	7	8.1667
3	5	9	7	-4	8.0	0	0.0000
4	3	7	5	-4	8.0	0	0.0000
5	6	8	7	-2	2.0	0	0.0000
6	4	6	8	-2	2.0	-6	6.0000
7	6	7	5	-1	0.5	3	1.5000
Mean	5.0000	7.1429	6.0000	-2.1429	(25.5) Sum	0.1429	(17.1667) Sum

$$SS_{A_{comp1}} = [(s)(\bar{\Psi})^2] / \sum (c_j)^2 = [(7)(-2.1429)^2] / 2 = 16.0714$$

$$SS_{A_{comp1xS}} = \sum (SS_{A_{comp1 \text{ for } s_j}}) - SS_{A_{comp1}} = 25.5000 - 16.0714 = 9.4286$$

$$SS_{A_{comp2}} = [(7)(0.1429)^2] / 6 = 0.02381$$

$$SS_{A_{comp2xS}} = 17.1667 - 0.02381 = 17.1429$$

Source	SS	df	MS	F
Comp 1	16.0714	1	16.0714	10.23 *
A <sub>comp1xS</sub>	9.4286	6	1.5714	
Comp 2	0.02381	1	0.02381	0.01
A <sub>comp2xS</sub>	17.1429	6	2.8571	

\*:  $p < .05; F_{crit}(1,6) = 5.99$

2. a. Omnibus analysis (All  $R^2$  are from SPSS output):

Source	$R^2$	df	Mean $R^2$	F
A	0.3040	$a-1=2$	0.1520	3.63 ( $p > .05$ ;
S	0.1942	$s-1=6$	0.03237	$F_{crit} = 3.89$ )
A x S	$1 - SS_A - SS_S = 0.5018$	$(a-1)(s-1)=12$	0.04182	
Total	1.0000	$as-1=20$		

b+c. Comparisons (All  $R^2$  are from SPSS output):

Source	$R^2$	df	Mean $R^2$	F
Comp 1	0.3035	1	0.3035	10.23 *
A <sub>comp1</sub> x S	0.1781	$s-1=6$	0.02968	
Comp 2	0.0004496	1	0.0004496	0.01
A <sub>comp2</sub> x S	0.3237	$s-1=6$	0.05395	

\*:  $p < .05$ ;  $F_{crit}(1,6) = 5.99$

# General Linear Model

## Within-Subjects Factors

Measure: MEASURE\_1

feedback	Dependent Variable
1	praise
2	reproof
3	none

## Descriptive Statistics

	Mean	Std. Deviation	N
Praise - Number of errors	5.0000	1.41421	7
Reproof - Number of errors	7.1429	1.06904	7
None - Number of errors	6.0000	1.73205	7

## Tests of Within-Subjects Effects

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
feedback	Sphericity Assumed	16.095	2	8.048	3.634	.058
	Greenhouse-Geisser	16.095	1.397	11.525	3.634	.083
	Huynh-Feldt	16.095	1.689	9.529	3.634	.070
	Lower-bound	16.095	1.000	16.095	3.634	.105
Error(feedback)	Sphericity Assumed	26.571	12	2.214		
	Greenhouse-Geisser	26.571	8.379	3.171		
	Huynh-Feldt	26.571	10.135	2.622		
	Lower-bound	26.571	6.000	4.429		

## Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	768.048	1	768.048	448.028	.000
Error	10.286	6	1.714		

## Regression - DV on a1 and a2

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.551 <sup>a</sup>	.304	.227	1.43095

a. Predictors: (Constant), a2, a1

### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.095	2	8.048	3.930	.038 <sup>a</sup>
	Residual	36.857	18	2.048		
	Total	52.952	20			

a. Predictors: (Constant), a2, a1

b. Dependent Variable: Number of errors

## Regression - DV on s1 s2 s3 s4 s5 and s6

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.441 <sup>a</sup>	.194	-.151	1.74574

a. Predictors: (Constant), s6, s4, s5, s3, s2, s1

### ANOVA<sup>b</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.286	6	1.714	.563	.753 <sup>a</sup>
	Residual	42.667	14	3.048		
	Total	52.952	20			

a. Predictors: (Constant), s6, s4, s5, s3, s2, s1

b. Dependent Variable: Number of errors

## Regression - DV on a1

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.551 <sup>a</sup>	.304	.267	1.39323

a. Predictors: (Constant), a1

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.071	1	16.071	8.280	.010 <sup>a</sup>
	Residual	36.881	19	1.941		
	Total	52.952	20			

a. Predictors: (Constant), a1

b. Dependent Variable: Number of errors

## Regression - DV on a1s1 a1s2 a1s3 a1s4 a1s5 and a1s6

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.422 <sup>a</sup>	.178	-.174	1.76319

a. Predictors: (Constant), a1s6, a1s5, a1s4, a1s3, a1s2, a1s1

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.429	6	1.571	.505	.794 <sup>a</sup>
	Residual	43.524	14	3.109		
	Total	52.952	20			

a. Predictors: (Constant), a1s6, a1s5, a1s4, a1s3, a1s2, a1s1

b. Dependent Variable: Number of errors

## Regression - DV on a2

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.021 <sup>a</sup>	.000	-.052	1.66905

a. Predictors: (Constant), a2

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.024	1	.024	.009	.927 <sup>a</sup>
	Residual	52.929	19	2.786		
	Total	52.952	20			

a. Predictors: (Constant), a2

b. Dependent Variable: Number of errors

## Regression - DV on a2s1 a2s2 a2s3 a2s4 a2s5 and a2s6

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.569 <sup>a</sup>	.324	.034	1.59932

a. Predictors: (Constant), a2s6, a2s5, a2s4, a2s3, a2s2, a2s1

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.143	6	2.857	1.117	.401 <sup>a</sup>
	Residual	35.810	14	2.558		
	Total	52.952	20			

a. Predictors: (Constant), a2s6, a2s5, a2s4, a2s3, a2s2, a2s1

b. Dependent Variable: Number of errors