

### SPSS for 2-factor Split-Plot ANOVA

#### I. Data File Format

- need four columns; one for factor A (whole-plot) treatment group designation, one for factor B (sub-plot) treatment group designation, one for block (or subject) designation, and one for data. For example: col 1 = block (BL) ; col 2 = factor A (A), col 3 = factor B (B); col 4 = data

1	1	1	7.00	
1	1	2	5.30	
1	1	3	4.90	
1	1	4	8.80	
2	2	1	9.90	
2	2	2	5.70	
2	2	3	7.60	
2	2	4	8.90	
3	1	1	8.50	
3	1	2	4.70	
3	1	3	5.50	
3	1	4	8.10	etc....

#### II. The Analysis

- this example is for a model I design

(1) From the pull-down menu:

Analyze → General Linear Models → Univariate <click on this>

(2) Specify the appropriate variables:

- for this example: “DATA” is the dependent variable, “FACTOR A” is the whole-plot factor, “FACTOR B” is the sub-plot factor and both are fixed variables, and “BLOCK” is random. Continue.

(3) Specify the appropriate ANOVA model:

- click on the “Model” button, then click on “Custom”, then add to the model list: “FACTOR A”, “FACTOR B” and the “FACTOR A \* FACTOR B” interaction term (add by holding down shift key, highlight both factors, then click on interaction arrow). Continue; ignore the warning message.

(4) Add whatever options you wish to the ANOVA analysis

- add to the analysis anything you might do in an ANOVA; for example, you might want to specify a multiple comparison procedure, power, check assumptions, etc.

(5) Alter the command language to get the correct denominator mean square term:

- click on the “Paste” button and a syntax window will appear with the program code in it. On the “DESIGN” subcommand line in the code, specify the *block within plot* effect by inserting after the whole-plot effect (i.e., FACTOR A) the following: BLOCK(FACTOR A)
- to run the program, click on the “Run Current” tool on the toolbar at the top of this syntax window.

#### III. The ANOVA Table

Tests of Between-Subjects Effects

Dependent Variable: DATA

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	759.003	1	759.003	259.045	.004
	Error	5.860	2	2.930 <sup>a</sup>		
FACTORA	Hypothesis	1.323	1	1.323	.451	.571
	Error	5.860	2	2.930 <sup>a</sup>		
BLOCK(FACTORA)	Hypothesis	5.860	2	2.930	2.578	.156
	Error	6.820	6	1.137 <sup>b</sup>		
FACTORB	Hypothesis	24.403	3	8.134	7.156	.021
	Error	6.820	6	1.137 <sup>b</sup>		
FACTORA * FACTORB	Hypothesis	8.153	3	2.718	2.391	.167
	Error	6.820	6	1.137 <sup>b</sup>		

a. MS(BLOCK(FACTORA))

b. MS(Error)