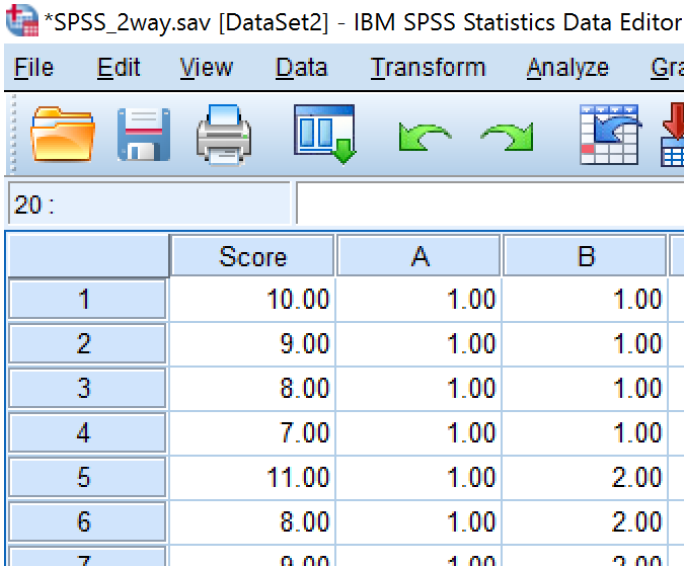
60080079 Introduction to Statistical Methods
Semester 2 2023-2024
Handout 12

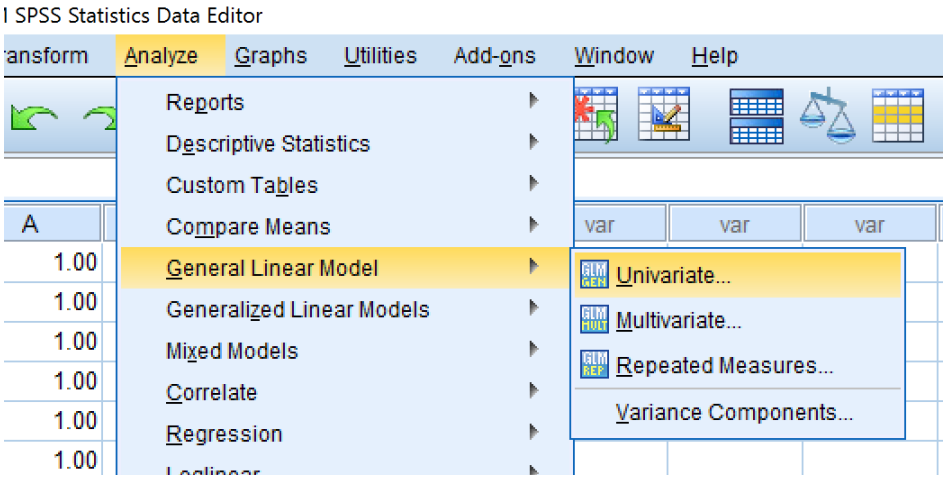
A Brief Introduction to Two-Way ANOVA in SPSS

1. Set up the **Week12_2way** data, which require one variable (e.g., Score) to be quantitative, and the two other variables (e.g., A and B) to be categorical.

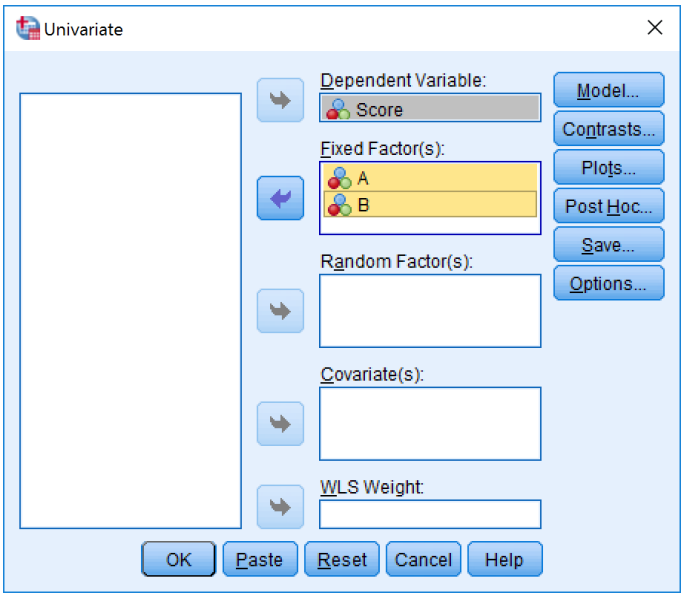


	Score	A	B
1	10.00	1.00	1.00
2	9.00	1.00	1.00
3	8.00	1.00	1.00
4	7.00	1.00	1.00
5	11.00	1.00	2.00
6	8.00	1.00	2.00

2. From the menu, **Analyze → General Linear Model → Univariate**.



3. In the **Univariate** dialog box, click in Score in the **Dependent Variable** box, and A and B in the **Fixed Factor(s)** box.



4. Click **OK**.

We should get the following output.

1) For each factor, a table that indicates how many subjects there are for each level of the factor.

Between-Subjects Factors

		N
A	1.00	12
	2.00	12
	3.00	12
B	1.00	12
	2.00	12
	3.00	12

2. The ANOVA table for the two-way model.

Tests of Between-Subjects Effects

Dependent Variable: Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.

Corrected Model	453.389[a]	8	56.674	22.420	.000
Intercept	4601.361	1	4601.361	1820.319	.000
A	413.556	2	206.778	81.802	.000
B	2.056	2	1.028	.407	.670
A * B	37.778	4	9.444	3.736	.015
Error	68.250	27	2.528		
Total	5123.000	36			
Corrected Total	521.639	35			

a. R Squared = .869 (Adjusted R Squared = .830)

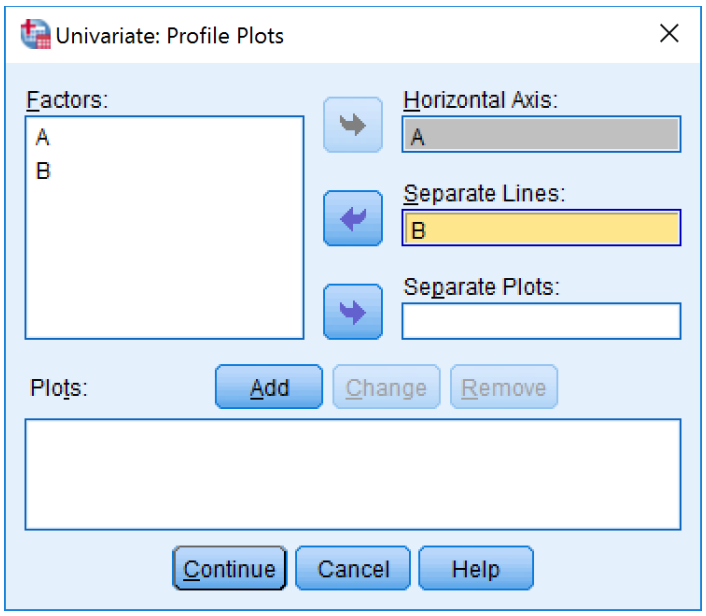
The results for the overall effect is given in the Corrected Model row; the results for the main effects due to Factor A, Factor B, and interactions are given in rows A, B ad A * B, respectively.

The results indicate that the 9 groups are not identical, and there is a main effect due to Factor A, an interaction effect, but no main effect due to Factor B.

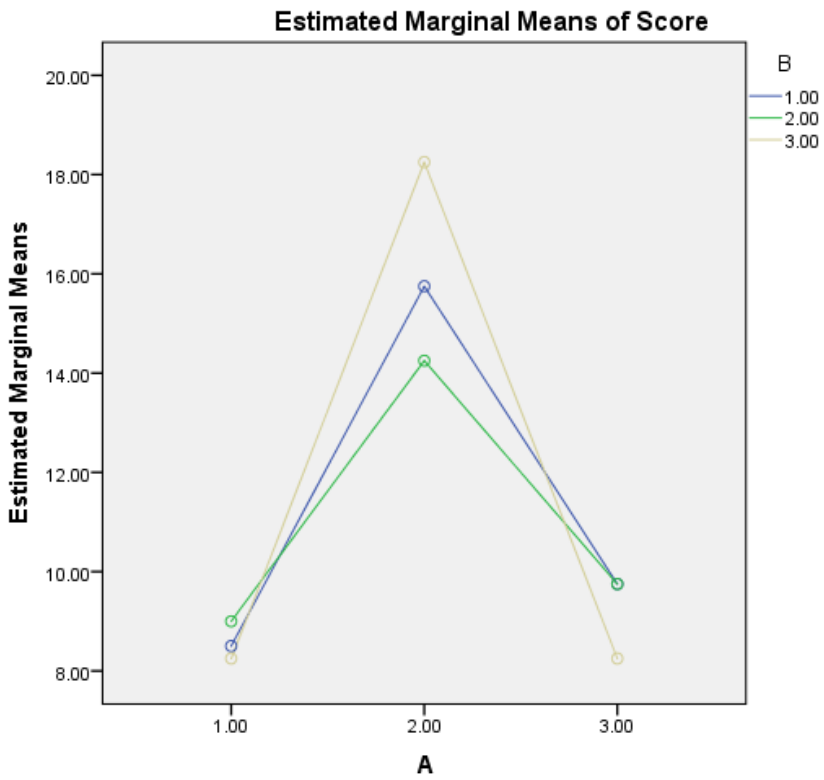
Aside: To visualize the pattern of the cell means, we can use **Plots** button in the Univariate dialog box.

Click in one factor in the **Horizontal Axis** box, and another factor in the **Separate Lines** box.

Make sure to click the **Add** button to specify A*B in the **Plots** box.



We should get the following plot:



The graph shows that the means of Factor A are different (Group 2 is much higher); the means of Factor B are quite similar; and there is an interaction between Factors A and B (the lines intersect).