

SPSS: k Within-Groups ANOVA & Trend Analyses

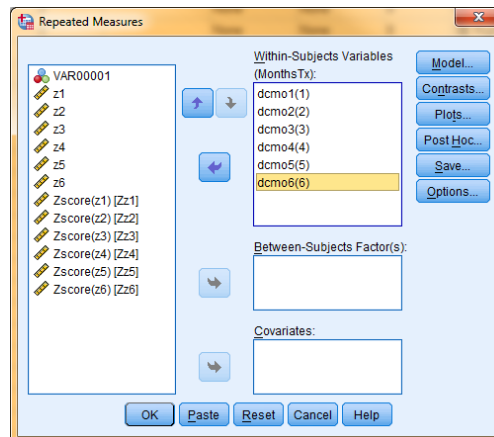
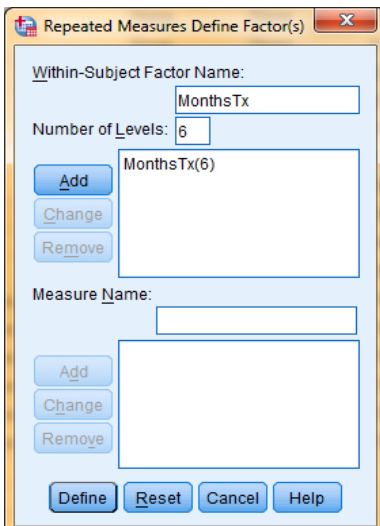
Application: To examine the “shape” of the IV-DV relationship (only used when IV conditions are equally spaced)

Research Hypothesis: The researcher hypothesized there would be a negative linear relationship between time in therapy and depression scores

H0: for this analysis: There is no mean differences among mean performance in the different anxiety conditions.

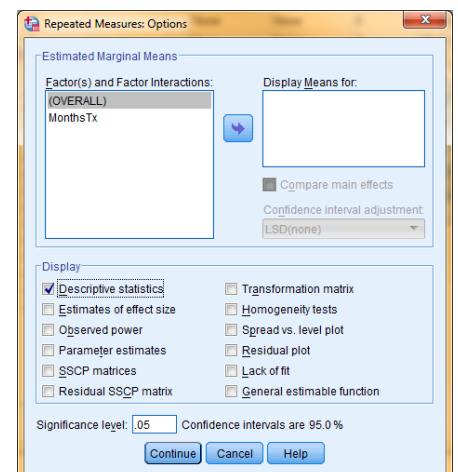
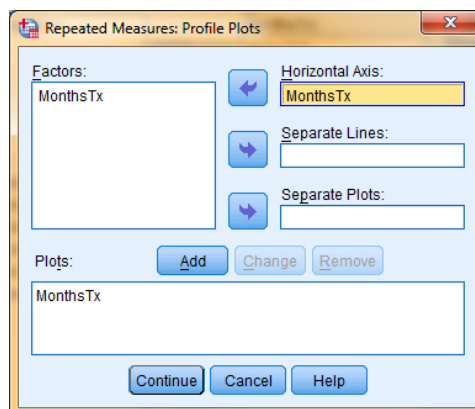
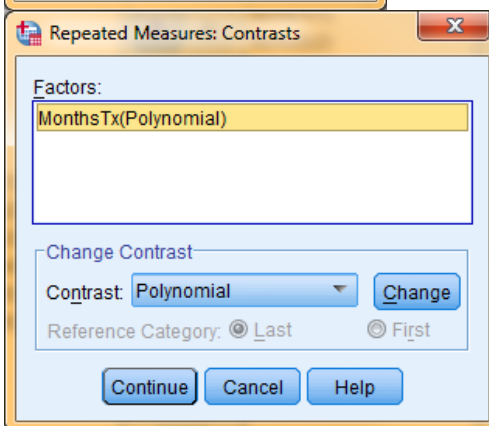
Analyze → General Linear Model → Repeated Measures

- enter your name for the IV in the “Within-subject Factor Name” window (MonthTx)
- enter the number of conditions of the IV in the “Number of levels” window (6)
- click the “Add” button
- click the “Define” button to go to the “Repeated Measures” window
- for each IV condition — highlight the variable that is the DV score for that condition and click the arrow
- Click the “Contrasts” – use the drop-down to select “Polynomial” & click “Change”
- Click the “Profile Plots” – and put the IV into the “Horizontal Axis” box
- Click the “Options” — check that you want “Descriptives”



Here is the SPSS syntax:

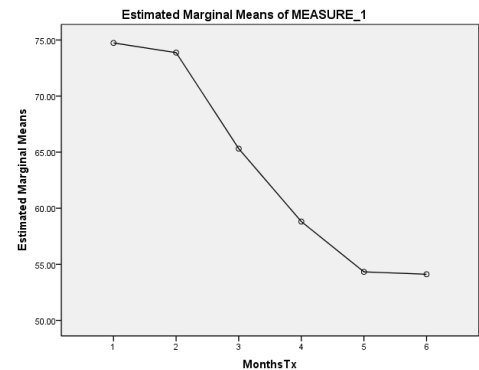
```
GLM dcmo1 dcmo2 dcmo3 dcmo4  
dcmo5 dcmo6  
/WSFACTOR=MonthsTx 6 Polynomial  
/METHOD=SSTYPE(3)  
/PRINT=DESCRIPTIVE  
/CRITERIA=ALPHA(.05)  
/WSDSIGN=MonthsTx.
```



Please note: The Polynomial procedure assumes that the IV conditions are equally spaced. If you have unequal spacing the polynomial tests will be misleading!

Descriptive Statistics

	Mean	Std. Deviation	N
dcmo1	74.7375	6.80240	42
dcmo2	73.8750	7.40920	42
dcmo3	65.3125	8.14990	42
dcmo4	58.8125	7.37120	42
dcmo5	54.3250	7.71610	42
dcmo6	54.1125	7.22880	42



Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
MonthsTx	Sphericity Assumed	18122.182	5	3624.436	63.137	.000
	Greenhouse-Geisser	18122.182	4.382	4135.408	63.137	.000
	Huynh-Feldt	18122.182	4.972	3645.074	63.137	.000
	Lower-bound	18122.182	1.000	18122.182	63.137	.000
Error(MonthsTx)	Sphericity Assumed	11768.303	205	57.406		
	Greenhouse-Geisser	11768.303	179.670	65.499		
	Huynh-Feldt	11768.303	203.839	57.733		
	Lower-bound	11768.303	41.000	287.032		

Remember, even if the printout shows it, never report $p = .000$, because that would suggest there is no possibility of a Type 1 error. Instead, report " $p < .001$ "

The p-value of means that there is less than a .1% chance that this result is a Type I error

Use the "Sphericity Assumed" df, Mean Square Error & p

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	MonthsTx	Type III Sum of Squares	df	Mean Square	F	Sig.
MonthsTx	Linear	16989.885	1	16989.885	252.935	.000
	Quadratic	191.101	1	191.101	3.161	.083
	Cubic	832.318	1	832.318	13.238	.001
Error(MonthsTx)	Linear	2754.005	41	67.171		
	Quadratic	2479.013	41	60.464		
	Cubic	2577.781	41	62.873		

The trend analysis results show...

A significant linear trend

- Inspection of the means & plot shows a negative linear trend
- This result supports the RH:

A nonsignificant quadratic trend

- This result supports the RH:

A significant cubic trend

- Inspection shows inflection points at 2 & 5 months
- This result does not support the RH: (of only a negative linear trend)

Reporting the Results

The mean depression scores for each amount of time in therapy are shown in Table/Figure 1. There was a difference among the group means, $F(5, 205) = 63.137$, $p < .001$, $Mse = 57.406$. As hypothesized there was a negative linear trend to the data, $F(1, 41) = 252.935$, $p < .001$, $Mse = 61.171$. Also, there was no quadratic trend, $F(1, 41) = 3.161$, $p = .083$, $Mse = 60.464$. However, contrary to the hypothesis there was also a significant Cubic trend, $F(1, 41) = 13.238$, $p = .001$, $Mse = 62.876$. In summary, the data show a combined trend including a negative linear and cubic trend such that depression scores changed little from the first to the second session, then decreased consistently through the fifth session and then leveled off.