On-the-job stress costs businesses billions of dollars each year. One of the things thought to influence such stress is the organizational structure of the job – a hierarchical or a matrix structure. This study collected data from several local businesses that had each managerial type, how long the participant had been on the job in that business and obtained a standardized job stress measure (larger scores mean more stress).
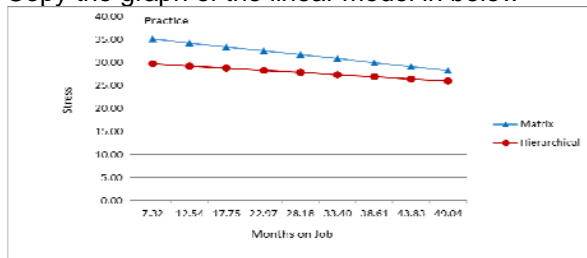
Linear Model

1. get the mean 28.18 and std _____ for months on the job

   compute a mean-centered (linear) term for college performance & a quadratic term (square of the mean centered variable)

2. Complete a linear GLM/UNIANOVA analysis

   - Use hier1_mat2 as the "BY" variable (remember how SPSS will code this)
   - Use the mean-centered jobmos as the "with" or "Covariate" variable
   - Include the linear interaction term in the Design statement
   - Use EMMEANS statements to test for group differences at 12, 24, 36 & 48 months

   R^2 .305   F25.878   df 3, 177 p .000

Effect	b
constant	31.657
jobmos	-.164
hier1_mat2	-3.860
Interaction	.073

3. Copy the graph of the linear model in below

4. Group comparisons

Months on Job	Hierarchical mean	p
12	29.271	.000
24	28.177971	.000
36	27.085111	.000
48	25.992252	.035

Non-linear Model

5. Complete a non-linear GLM/UNIANOVA analysis

- Use hier1_mat2 as the "BY" variable (remember how SPSS will code this)
- Use the mean-centered jobmos & quadratic jobmos as the "with" or "Covariate" variables
- Include the linear & non-inear interaction terms in the Design statement
- Use EMMEANS statements to test for group differences at 12, 24, 36 & 48 months

R^2 .473   F 31.393   df 5, 175 p .000

Effect	b	p
constant	29.412	
jobmos linear	-.200	.000
jobmos quad	.021	.000
hier1_mat2	.039	.955
Linear interaction	.100	.029
Quadratic interaction	-.036	.000

6. Group comparisons

Months on Job	Matrix mean	p
12	34.960269	.000
24	32.556444	.000
36	30.152620	.000
48	27.748795	.058

7. Recode "hier1_mat2" into "hier2_mat1" & get "the other quadratic GLM model".

Verify you got the same R-sq & F-values

Verify that the constant, linear slope & quadratic slope terms match the values for the Hierarchical group you got from the plotting program (where it shows the regression model for each group)

Verify that the group comparison, linear interaction and quadratic interaction terms are all the same value but with opposite sign as from the earlier non-linear model (using hier1_mat2)

8. Copy the graph of the quadratic model in below