SPSS: k Between Groups ANOVA & Trend Analyses

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


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

Analyze ➔ General Linear Model ➔ Univariate
- highlight the “Dependent” variable (be sure it is quantitative) and click the arrow
- highlight the “Factor” (IV, grouping) variable (be sure it is qualitative) and click the arrow
- “Options” — check that you want “Descriptive Statistics”
- “Contrasts” – Highlight “Polynomial” & click “Change”
- “Plots” – Move IV into “Horizontal Axis” then click “Add”

SPSS Syntax

UNIANOVA perf BY anx_lvl /CONTRAST(anx_lvl)=Polynomial /METHOD=SSTYPE(3) /PLOT=PROFILE(anx_lvl) /PRINT=DESCRIPTIVE.

Please Note: You can also perform this analysis using the “ONEWAY” procedure we used for the 2 BG ANOVA and analytic comparisons. It has the same polynomial choices and produces equivalent output.
Remember, even if the printout shows it, never report \( p = .000 \), because that would suggest there is no possibility of a Type I error. Instead, report “\( p < .001 \)”

The p-value of .000 means that there less than a .1% chance that this result is a Type I error.

The trend analysis results show...

- A significant linear trend
  - Inspection of the means and plot shows that this is a positive linear trend
  - This results does not support the RH:

- A significant quadratic trend
  - Inspection of the means and plot shows that this is an inverted U-shaped quadratic trend
  - This results supports the RH:

- A nonsignificant cubic trend
  - This results supports the RH:

Note:
You can compute the t-value for each comparison using
\[ t = \frac{\text{Difference (Estimate – Contrast)}}{\text{Std. Error}} \]

For the Linear trend this would be \( t = 2.052 / .448 = 4.580 \) With \( df = 54 \)

Or if you prefer, \( F = t^2 \) \( F = 4.580^2 = 20.975 \) \( df = 1, 54 \)

Reporting the Results

The average performance for each anxiety level is summarized in Table/Figure 1. There were significant mean differences in the performances among the anxiety levels, \( F(5, 54) = 10.663, \) \( Mse = 2.010, p < .001 \). Trend analyses revealed that, as hypothesized, there was a quadratic component to the relationship, \( F(1,54) = 28.552, p<.001 \), with the highest average performance for anxiety level 4. Also, there was no cubic trend, \( F(1,54) = .198, p = .666 \). However, contrary to the research hypothesis, there was also a positive linear component to the relationship, \( F(1, 54) = 20.975, p<.001 \), with higher average performance for the higher anxiety levels than for the lower anxiety levels.