

**PSY 653 Module 2: Orthogonal contrasts, Polynomial Contrasts, and Moderation**  
**Feb 03, 2021**

Module 2.1: Orthogonal contrasts

Use this ANOVA complete the following steps:

	Mean	Contrast 1	Contrast 2
Group 1	35	-1	1
Group 2	40	-1	-1
Group 3	45	2	0

$N/\text{cell} = 30$  ( $N_{\text{total}} = 90$ )

$SS_{\text{total}} = 5000$

- 1) Are the contrasts orthogonal? How do you know? (Slide 6!)
- 2) Calculate the Sums of Squares for contrast 2 (Slide 11!)
- 3) Calculate the eta-squared for contrast 2 (Slide 12!)

## Module 2.2: Polynomial contrasts

The “memory.csv” datafile contains results from an experimental study in which they tested different doses of a drug on participant memory scores. This data file consists of 4 variables:

- 1.) **ID** = Participant ID#
- 2.) **age** = Participant age
- 3.) **Dosage** = Dosage of the medication that was administered (1, 2, or 3 doses)
- 4.) **Mem\_Score** = The score the participant received on the memory test (Possible values = 0 – 100)

1. Create a new R notebook and load the following libraries: tidyverse, psych, olsrr
2. Read in the datafile “memory.csv”.
3. Based on the variable description, there are three levels of the Dosage variable. What type of effects can you test for? Can you test a linear effect? A quadratic effect? A cubic effect?
4. Obtain the dataset descriptives
5. Plot the relationship between Dosage and Mem\_Score. What type of relationship do you think exists, if any?
  - a. Hint: You will use a combination of geom\_point() & geom\_smooth() to plot this relationship (Slide 22!).
6. Use the mutate function to create the linear and quadratic contrasts for the Dosage variable.
  - a. Hint: Refer to slide 23 of the lab slides to correctly code your linear and quadratic contrasts for 3 treatment levels.
7. Use the method of polynomial coding to test hypotheses about the relationship between Mem\_Score and the 3 different levels of the Dosage variable.
8. Which type of relationship, if any, best fits the data for this research question? Is there a linear relationship? How about a quadratic relationship?

### Module 2.3: Moderation

Use the “moderation\_sleepdata.csv” datafile to practice conducting a moderated regression on your own. This datafile includes data from 600 adult participants who were suffering from a sleep disorder. This data file consists of 5 variables:

- 1.) **age** = Participant age
- 2.) **anxiety** = Participant anxiety level. Higher scores indicate more anxiety (Possible values = 1.00 – 7.00)
- 3.) **hygiene** = Participant sleep hygiene score. Higher scores indicate better sleep hygiene (Possible values = 1.00 – 10.00)
- 4.) **sleep** = Participant sleep efficiency. Higher scores indicate better sleep (Possible values = 0 – 100)
- 5.) **lifesat** = Participant life satisfaction scores. Higher scores indicate better life satisfaction (Possible values = 1.00 – 7.00)

- 1) Read in the datafile “moderation\_sleepdata.csv”
- 2) Get data descriptives
- 3) Using mutate(), create a new variable for the product of hygiene and anxiety. Name this new variable “hyganx”.
- 4) Run a regression to test the main effects of hygiene and anxiety on sleep and interpret the model results
- 5) Run the same regression that also includes the interaction term between hygiene and anxiety and interpret the model results
- 6) Compare the fit of the two models using anova() and interpret these results
- 7) Write this set of results up the way you would for an APA journal