**Psychology 450 Laboratory Homework**

**ANCOVAs with Interactions Lab Dataset 🡪 ancovalab\_data1\_141.sav**

The purpose of the study was to examine the relationship between Practice & Task Novelty upon Performance. Participants were taught a finger dexterity task involving threading nuts onto a series of stationary bolts as quickly as possible for 30 seconds. They were told they would be performing a similar task and would be paid $1 for each nut they completed. They were told they could practice as many times as they liked before the performance testing. When each participant had practiced as many times as they liked, they were randomly assigned to one of three performance tasks: 1) Novel – the performance task was to push a nut onto a series of stationary posts until it clicked, continue to push while rotating clockwise until it clicked again and continue to push while rotating counter-clockwise until it clicked again, 2) Dissimilar – threading nuts onto a series of stationary bolts, but they were reverse-threaded (had to be threaded counter-clockwise – opposite the traditional “lefty-loosey righty-tighty” logic, and 3) Similar – threading nuts onto a series of stationary bolts (like the training task).

**Preliminary Analyses**

#1 Perform the ANOVA using Task as the IV & Perf as the DV.

 F = \_\_\_\_\_\_\_\_ df = \_\_, \_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

 Fill in the Performance means for each Task group:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Novel | Dissimilar | Similar |
| Mean Performance |  |  |  |

Describe the results (eyeballing the pairwise comparisons):

#2 Perform the ANOVA using Task as the IV & Practice as the DV

 F = \_\_\_\_\_\_\_\_ df = \_\_, \_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

 Fill in the Practice means for each Task group:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Novel | Dissimilar | Similar |
| Mean Practice |  |  |  |

Is practice a confound?

#3 Get the correlation between Performance & Practice

 r = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

#4 Something new (and a bit informal)…

Split the data file by Task – then get the correlation between Performance & Practice for each group

|  |  |  |  |
| --- | --- | --- | --- |
|  | Novel | Dissimilar | Similar |
| r |  |  |  |
| p |  |  |  |

Mathematically and statistically speaking, an interaction is about a DV-Covariate regression slope difference across the IV groups. However, often if there are DV-Covariate correlation differences there are also DV-Covariate regression slope differences, but it is much quicker to check correlations than slope (just remember to remove the “split cases” after…)

#5 So, is there any indication that an ANCOVA may give a different result than an ANOVA for this analysis?

Is practice a strong confounding variable? If so, you will want to “control it”…

Is it substantially correlated with the DV? If so, you will want to “control it”…

Does it appear to be differently related to the DV for different IV groups? If so, you will want to check for an interaction between the IV & Covariate…

**Full/Interaction ANCOVA Analyses** (using **mean centered covariate** to **get the graph**)

#1 Get the mean and std for practice mean \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ std \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#2 Paste below the syntax you will use to compute the mean-centered practice

#3 Paste below the syntax you will use to get the ANCOVA and the regression parameter estimates for the interaction model.

#4 Use the xls program to get the plot of the interaction model – be sure to get your labels and weights in the right places!

Copy the plot here

**Full/Interaction ANCOVA Analyses** (using **raw covariate** to **get the simple effects**)

#1 Paste below the UNIANOVA code to get the Full/Interaction model ANCOVA – including the “EMMEANS” lines to get the corrected group comparisons at 10, 30 & 50 practices.

 Main effect of task: F = \_\_\_\_\_\_\_\_ df = \_\_, \_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

 Main effect of practice: F = \_\_\_\_\_\_\_\_ df = \_\_, \_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

 Interaction: F = \_\_\_\_\_\_\_\_ df = \_\_, \_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| 10 practices pairwise comparisons 🡪 | Similar vs. Dissimilar | Similar vs. Novel | Dissimilar vs. Novel |
| Means Comparison |  |  |  |
| EMMEANS p-value |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 30 practices pairwise comparisons 🡪 | Similar vs. Dissimilar | Similar vs. Novel | Dissimilar vs. Novel |
| Means Comparison |  |  |  |
| EMMEANS p-value |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 50 practices pairwise comparisons 🡪 | Similar vs. Dissimilar | Similar vs. Novel | Dissimilar vs. Novel |
| Means Comparison |  |  |  |
| EMMEANS p-value |  |  |  |