

PSYC 943: Fundamentals of Multivariate Modeling

Homework #2 (Total 10 Points)

Due: Friday, September 13, 2013 at 12pm.

General Instructions: This homework assignment focuses on a study conducted in the Department of Recreational Sciences designed to meet two objectives.

First, the investigators wanted to examine the extent to which performance in miniature golf could benefit from a new approach to skills training, as well as the extent to which training in related activities (i.e., regular golf) might differentially impact performance. To that end, 200 students at Midwestern Red State University were randomly assigned to one of four conditions: control (usual mini-golf skills instruction), new training for mini-golf only, new training for regular golf only, or new training in both mini-golf and regular golf. The dependent variable was the number of strokes taken on a high-stakes 18-hole round of mini-golf held at the conclusion of training, in which **lower scores (fewer strokes) indicate better performance**.

In the data, the group variable indicates which group a student was assigned to: 1 = control, 2 = mini-golf only, 3 = regular golf only, and 4 = both mini and regular golf.

Second, the investigators also wanted to examine the effects of experience with and enthusiasm for the sport of mini-golf. To that end, prior to beginning the study, participants indicated their previous amount of mini-golf experience on a 1-7 scale, and also completed the Mini-Golf Enthusiasm Scale (MGES). The MGES has been shown in previous research to be a perfectly reliable measure of mini-golf enthusiasm whose items perfectly fit a one-factor model. Therefore, latent trait estimates (Mean~0, SD~1) derived from the MGES were used as an observed predictor variable, along with training group and experience level.

Your task is to estimate a single general linear model that answers these specific research questions:

Research Q1: To what extent do training group, experience, and enthusiasm each predict mini-golf performance?

Research Q2: To what extent does the effect of training group depend on experience with mini-golf?

Use the control group as the reference for training group, use 4 as the centering point for experience, and use 0 as the centering point for enthusiasm. Specific estimates may be provided in the model or requested separately as needed. In each comparison question, the group before VS. is the base for the comparison, such that the comparison reflects the effect of being in the group after the VS. Direction will matter, so please keep this in mind.

Short Answer Homework Questions (.5 points each):

1. What is the Mean Square Error (residual variance)?
2. What is the overall R-square?
3. What is estimate for the fixed intercept?
4. What is the estimate for the effect of enthusiasm?
5. What is the estimate for the effect of experience for control?

6. What is the estimate for the effect of experience for mini-golf training only?
7. What is the estimate for the effect of experience for regular golf training only?
8. What is the estimate for the effect of experience for both golf training?
9. What is the estimate for the effect of control vs. mini-golf training only for experience=4?
10. What is the estimate for the effect of control vs. regular golf training only for experience=4?
11. What is the estimate for the effect of control vs. both golf training for experience=4?
12. What is the estimate for the effect of mini-golf only vs. both golf training for experience=4?
13. What is the estimate for the effect of regular golf only vs. both golf training for experience=4?
14. What is the estimate for the interaction of experience by control vs. mini-golf training only?
15. What is the estimate for the interaction of experience by control vs. regular golf training only?
16. What is the estimate for the interaction of experience by control vs. both golf training?
17. What is the estimate for the interaction of experience by mini-golf only vs. both golf training?
18. What is the estimate for the interaction of experience by regular golf only vs. both golf training?

Writing Question (1 point):

19. Summarize the results of your experiment in an APA-formatted results section. In your answer, be sure to state the research hypotheses and the tests of these hypotheses. Use the remaining estimates to help describe the results of your study.

Submission Instructions:

All homework and final answers must be your own and not be copied or paraphrased from anyone else's answers. Homework must be submitted via email (jtemplin@unl.edu) in the form of Microsoft Word document with the name: 943_FirstLast_HW#.docx. Late homework will have a penalty of 10% per calendar day.