

ERSH 8310, Fall 2007

Homework #1

Due: Tuesday 9/18/2007 at 9:00pm

Homework format: all homework answers must be provided electronically. Please answer each question with as much detail as you can provide. Do not provide direct SPSS (or other package) output for any question (the exception being figures/graphs).

A researcher thinks that music affects concentration. He hypothesizes that soft music will increase concentration; moderately loud music will have no effect on concentration, and loud music will detract from concentration. He randomly breaks 24 college students into four groups. All groups are given a reading comprehension task while listening to a tape of their favorite music (which each subject was asked to bring to the experiment). The Soft Group hears the music at a low background level, similar to that played in a grocery store: It is there, but you can hardly hear it. The Moderate Group hears the music at listening level: The music is clearly present and can be easily heard. The Loud Group hears the music at a very high level. The Control Group hears only the soft sounds of an air conditioning system.

Reading Comprehension Scores

Soft	Moderate	Loud	Control
20	36	25	22
12	30	28	15
12	32	25	27
13	36	20	19
17	30	25	20
17	33	24	21

The data in the table are reading comprehension scores; the higher the score the greater the comprehension.

1. What are the independent and dependent variables?
2. What is (are) the scientific hypothesis(es) (in words)? What are the statistical hypotheses?
3. Find the means of the four groups and graph them.
4. Test the statistical hypotheses using a Type I error rate of 0.05. Report the ANOVA table and interpret the Sums of Squares, degrees of freedom, Mean Squares, and F-value.
5. Make a decision about the null hypothesis: do you reject or fail to reject? Why (report and interpret the p-value)?