Biostat 510
Homework 8
Due Tuesday, March 30, 2010

State the alpha level that you are using for any statistical tests carried out for this homework. When reporting the results of a statistical test, include the test statistic, the degrees of freedom, and the p-value of the test.

1. Download the Excel files, Group1.xls through Group6.xls from my web page (http://www.umich.edu/~kwelch). Be sure to get the Homework 8 versions of the Excel files, because they've been fixed so they're ready to be imported into SPSS.
    a) Open each Excel file into SPSS
        i. Paste the syntax to do this into an SPSS syntax window
    b) Save each Excel file as an SPSS dataset: Group1.sav, Group2.sav, etc.
        i. Paste this syntax into the syntax window also.
    c) Merge the files, so that they form one stacked dataset. (Go to Data…Merge Files…Add Cases).
        i. You will have to do this by merging one file at a time
        ii. Paste the syntax to merge the files into your syntax window
    d) Save your new merged file as ALLGROUPS.SAV.
    e) By now, your syntax will be pretty long. Save this syntax file as homework8.sps.

2. Check your dataset, by visual inspection and by getting a frequency tabulation of GROUP.
    a) Scan through the dataset to be sure all six groups are there
    b) Get a frequency tabulation of the variable GROUP, so you can check how many students are in each group, and be sure that all six groups are in your dataset.
    c) How many students are in this dataset all together?

✓ Include this frequency tabulation in your homework write-up.

    d) Paste the syntax for this frequency tabulation in the homework8.sps syntax window.

3. Compute HRDIFF, which is equal to HR2 minus HR1.
    a) Create HRDIFF as HR2 – HR1 by going to Transform…Compute Variable...
    b) Paste the syntax for creating this new variable into your homework8.sps syntax window. Be sure to highlight and submit this syntax.
    c) Verify that your new variable has been created and is at the end of your dataset, by scanning the datast.
    d) Resave your ALLGROUPS.SAV dataset with the new variable in it.

4. Get Descriptive statistics for all cases for all numeric variables in your dataset.
    a) How many observations are there in the dataset?
        i. What is the number of ***listwise*** complete cases?

✓ Include this output in your write-up.

ii. Paste this syntax into your syntax file, homework8.sps.

b) Get descriptive statistics separately for those who ran and those who did not run using Descriptives…after splitting the file by RAN.

i. Split the file, by going to Data…Split File…Organize Output by Groups… choose RAN as the variable for the "Groups Based On:" box. Paste this syntax into your syntax window, and be sure to highlight and Run it.

ii. What are the mean and standard deviation of HR1 for those who ran? For those who did not run?

iii. What are the mean and standard deviation of HR2 for those who ran? For those who did not run?

iv. What are the mean and standard deviation of HRDIFF for those who ran? For those who did not run?

v. Paste the syntax for the descriptive statistics into your syntax window.

✓ Include the output from these descriptive statistics in your write-up.

5. Generate side-by-side boxplots of HR1, HR2, and HRDIFF for those who ran and did not run.

a) You will need to keep the Split file on…so you don't have to do anything with that.

b) Briefly describe the side-by-side boxplots for each variable. Discuss: the median, spread, and outliers for each graph, comparing those who ran to those who did not run.

c) Include these three boxplots in your homework write-up.

d) Paste the syntax for the boxplots into your syntax file.

6. Carry out an independent samples t-test to compare the mean of HR1, HR2, and HRDIFF for those who ran vs. those who did not run.

a) You will need to turn Split file off, before doing this problem. Go to Data…Split File and select "Analyze all cases, do not create groups". Paste this syntax into your syntax window, and be sure to run it to turn off the split file.

b) Report the Levene's test for homogeneity of variance for each variable. Which t-test is appropriate for each variable?

c) What do you conclude about the mean of HR1, HR2, and HRDIFF for those who ran vs. those who did not run? (Include the t-test statistic, the degrees of freedom, and the p-value for each test in your statements).

✓ Include the output from these independent samples t-tests in your write-up.

d) Paste the syntax for the t-tests into your syntax file.

7. Carry out a paired samples t-test to compare the mean of HR1 to that of HR2 for everyone in the sample. For this, you will still be analyzing all cases.

a) What is the correlation between HR1 and HR2 for the entire sample?

b) Is there a difference in the mean of heartrate at time 1 vs. the mean of heartrate at time 2 for the group as a whole?

✓ Include the output from the paired t-test for the entire group in your write-up.

8. Carry out a paired t-test to compare the mean of HR1 to the mean of HR2 separately for those who ran and those who did not run, after splitting the file.
    a) Split the file by RAN, paste your syntax for this, and be sure to run it.
    b) Is there a difference in the mean of heartrate at time 1 vs. the mean of heartrate at time 2 for those who ran? For those who did not run?
✓ Include the output from the paired t-tests for each level of RAN in your write-up.
    c) Paste the syntax for these commands into your syntax file.

9. Carry out a one-sample t-test to test whether the mean of HRDIFF=0 for the entire sample and for those who ran and did not run (Use Analyze…Compare Means…One-sample t-test).
    a) Is the mean of HRDIFF different from zero for everyone in the class?
        i. Remember to turn the split file off before running this test.
        ii. Paste the syntax for turning off the split file and for the t-test to your syntax file.
    b) Rerun your one-sample t-test separately for those who ran and those who did not run.
        i. Remember to turn split file on before running this test.
        ii. Paste the syntax for splitting the file and running the t-test to your syntax file.
    c) Is the mean of HRDIFF different from zero for those who ran? For those who did not run?
✓ Include your one-sample t-tests for the whole group and for those who ran and did not run in your homework write-up.

Resubmit all the commands from your Homework8.sps file and check that your program runs without any errors by scanning the output for errors.

NB: You will be graded on the commands, the output, and your write-up. You should include your homework8.sps syntax file as the first part of your homework write-up.