**Data File 5**

# Chapter Nine

Show all work

Problem 1)

A skeptical paranormal researcher claims that the proportion of Americans that have seen a UFO is less than 1 in every one thousand. State the null hypothesis and the alternative hypothesis for a test of significance.

Problem 2)

At one school, the average amount of time that tenth-graders spend watching television each week is 18.4 hours. The principal introduces a campaign to encourage the students to watch less television. One year later, the principal wants to perform a hypothesis test to determine whether the average amount of time spent watching television per week has decreased. Formulate the null and alternative hypotheses for the study described.

Problem 3)

A two-tailed test is conducted at the 5% significance level. What is the P-value required to reject the null hypothesis?

Problem 4)

A two-tailed test is conducted at the 5% significance level. What is the right tail percentile required to reject the null hypothesis?

Problem 5)

What is the difference between an Type I and a Type II error? Provide an example of both.

# Chapter 10

Show all work

Problem 1)

Steven collected data from 20 college students on their emotional responses to classical music. Students listened to two 30-second segments from “The Collection from the Best of Classical Music.” After listening to a segment, the students rated it on a scale from 1 to 10, with 1 indicating that it “made them very sad” to 10 indicating that it “made them very happy.” Steve computes the total scores from each student and created a variable called “hapsad.” Steve then conducts a one-sample t-test on the data, knowing that there is an established mean for the publication of others that have taken this test of 6. The following is the scores:

5.0 5.0

10.0 3.0

13.0 13.0

7.0 5.0

5.0 15.0

14.0 18.0

8.0 12.0

10.0 7.0

3.0 15.0

4.0 3.0

1. Conduct a one-sample t-test. What is the t-test score? What is the mean? Was the test significant? If it was significant at what P-value level was it significant?
2. What is your null and alternative hypothesis? Given the results did you reject or fail to reject the null and why?

(Use instructions on page 349 of your textbook, under Hypothesis Tests with the t Distribution to conduct SPSS or Excel analysis).

Problem 2)

Billie wishes to test the hypothesis that overweight individuals tend to eat faster than normal-weight individuals. To test this hypothesis, she has two assistants sit in a McDonald’s restaurant and identify individuals who order the Big Mac special for lunch. The Big Mackers as they become known are then classified by the assistants as overweight, normal weight, or neither overweight nor normal weight. The assistants identify 10 overweight and 10 normal weight Big Mackers. The assistants record the amount of time it takes them to eight the Big Mac special.

1.0 585.0

1.0 540.0

1.0 660.0

1.0 571.0

1.0 584.0

1.0 653.0

1.0 574.0

1.0 569.0

1.0 619.0

1.0 535.0

2.0 697.0

2.0 782.0

2.0 587.0

2.0 675.0

2.0 635.0

2.0 672.0

2.0 606.0

2.0 789.0

2.0 806.0

1. 600.0
2. Compute an independent-samples t-test on these data. Report the t-value and the p values. Where the results significant? (Do the same thing you did for the t-test above, only this type when you go to compare means, click on independent samples t-test. When you enter group variable into grouping variable area, it will ask you to define the variables. Click define groups and place the number 1 into 1 and the number 2 into 2).
3. What is the difference between the mean of the two groups? What is the difference is standard deviation?
4. What is the null and alternative hypothesis? Do the data results lead you to reject or fail to reject the null hypothesis?
5. What do the results tell you?

Problem 3)

Lilly collects data on a sample of 40 high school students to evaluate whether the proportion of female high school students who take advanced math courses in high school varies depending upon whether they have been raised primarily by their father or by both their mother and their father. Two variables are found below in the data file: math (0 = no advanced math and 1 = some advanced math) and Parent (1= primarily father and 2 = father and mother).

Parent Math

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

1.0 0.0

2.0 0.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 1.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

2.0 0.0

1. Conduct a crosstabs analysis to examine the proportion of female high school students who take advanced math courses is different for different levels of the parent variable.
2. What percent female students took advanced math class
3. What percent of female students did not take advanced math class when females were raised by just their father?
4. What are the Chi-square results? What are the expected and the observed results that were found? Are they results of the Chi-Square significant? What do the results mean?
5. What were your null and alternative hypotheses? Did the results lead you to reject or fail to reject the null and why?

Problem Four)

This problem will introduce the learner into a technique called Analysis of Variance. For this course we will only conduct a simple One-Way ANOVA and touch briefly on the important elements of this technique. The One-Way ANOVA is an extension of the independent –t test that can only look at two independent sample means. We can use the One-Way ANOVA to look at three or more independent sample means. Use the following data to conduct a One-Way ANOVA:

Scores Group

1 1

2 1

3 1

2 2

3 2

4 2

4 3

5 3

6 3

Notice the group (grouping) variable, which is the independent variable or factor is made up of three different groups. The scores are the dependent variable.

Use the instructions for conduction an ANOVA on page 366 of the text for SPSS or Excel.

1. What is the F-score; Are the results significant, and if so, at what level (P-value)?
2. If the results are significant to the following: Click analyze, then click Compare Means, and then select one-way ANOVA like you did previously. Now click Post Hoc. In this area check Tukey. If there is a significant result, we really do not know where it is. Is it between group 1 and 2, 1 and 3, or 2 and 3? Post hoc tests let us isolate where the level of significance was. So if the results come back significant, conduct the post hoc test as I mentioned above and explain where the results were significant.
3. What do the results obtained from the test mean?