WolfWare / Dashboard / My courses / ST 517 (651) SUM1 2021 / Topic 7: Inference for Two Groups / Quiz 7

Started on	Wednesday, July 7, 2021, 9:15 AM
State	Finished
Completed on	Wednesday, July 7, 2021, 5:57 PM
Time taken	8 hours 41 mins
Grade	**9.40** out of 10.00 (**94**%)

Question **1**
Correct
1.00 points out of 1.00

Suppose a hypothesis test for the population mean difference of paired data is correctly conducted and the decision is made to <u>not</u> reject the null hypothesis. What type of error could have been made?

Select one:

- ○ a.   Neither type of error could have been made if the test was conducted correctly.

- ○ b.   A Type I Error

- ○ c.   Either type of error could have been made.

- ◉ d.   A Type II Error   ✔

Your answer is correct.

The correct answer is: A Type II Error

Question **2**

Correct

1.00 points out of 1.00

A developer is recording information about houses in two different neighborhoods, including the year in which they were built. She takes a random sample of 30 houses from Neighborhood 1 and a random sample of 35 houses from Neighborhood 2, resulting in the following summary statistics:

$\bar{x}_1 = 57.2; \ s_1 = 9.51$

$\bar{x}_2 = 47.6; \ s_2 = 6.15$

Use this information to calculate the lower bound of the 90% (un-pooled) confidence interval for the true difference (neighborhood 1 - neighborhood 2) in average age for houses in these neighborhoods. Use technology (such as an online t-distribution calculator) to find the appropriate value of the multipler.

Round your answer to 3 decimal places.

Answer: 6.161   ✔

The correct answer is: 6.162

Question **3**

Correct

1.00 points out of 1.00

Do males and females consume different amounts of sweetened soft drinks? A study compared male and female students in the 4th grade. The study recorded the daily intake (in fluid ounces) of sodas, fruit drinks and other sweetened drinks of 20 males and 20 females. The resulting summary statistics are given below.

Gender	n	mean	St. dev
male	20	18.3	12.0
female	20	15.4	11.3

We would like to perform a test of hypothesis based on the pooled variance. Calculate the pooled VARIANCE in this situation.

Round your answer to 2 decimal places.

Answer: 135.85   ✔

The correct answer is: 135.84

Question **4**

Complete

1.50 points out of 2.00

The test statistic for the pooled 2-sample t-test based on the data in the previous question is 0.73. Write a sentence interpreting this value in the context of the problem.

In our specific sample, our average is .73 standard errors above what we would expect if there were truly no difference between the number of sodas, fruit drinks, and other sweetened drinks between male and female students for the population represented by this sample.

The sample results* were 0.72 standard errors above what we would expect if the there were no difference in average daily intake of sweetened soft drinks.

* Could also say "the difference in sample means"

Comment:
It should be difference in means

Question **5**

Correct

1.00 points out of 1.00

A study is conducted to see how effective aspirin is in *reducing temperature* in children. A sample of 6 children suffering from influenza had their temperatures taken immediately before and 1 hour after administration of aspirin. The results are given below. We would like to conduct a paired differences t-test for this situation. The data follows.

Patient	Temperature Before	Temperature After	Difference
1	103.7	102.6	1.1
2	103.7	102.7	1.0
3	100.7	98.8	1.9
4	102.7	103.5	-0.8
5	102.7	101.3	1.4
6	100.7	99.4	1.3
Mean	102.4	101.4	1.0
Std. Dev.	1.4	1.9	0.9

Note: *Children under 17 should not be given aspirin unless advised by a physician, due to the possibility of Reyes Syndrome, a disease affecting the liver and brain.*

Calculate the appropriate test statistic of a matched pairs t-test for this data to see if taking aspirin will *reduce* a child's fever.

Round your answer to **2 decimal places**.

Answer: 2.70 ✔

The correct answer is: 2.72

Question **6**

Correct

1.00 points out of 1.00

Consider the previous scenario. Which null distribution should be used to find the appropriate p-value for this test?

Select one:

- ⦿ a.   t-distribution with df=5 ✔
- ◯ b.   t-distribution with df=6
- ◯ c.   Standard normal distribution
- ◯ d.   t-distribution with df=10

Your answer is correct.

The correct answer is: t-distribution with df=5

Question **7**

Partially correct

0.90 points out of 1.00

In a large study, a random sample of 595 pet owners and a random sample of 1939 people who do not own a pet was selected. Of the pet owners, 53.3% were married. Of the non-pet owners, 57.7% were married. Use this information to calculate the 90% confidence interval for the difference in the true proportions of pet owners who are married and the proportion of non-pet owners who are married. (Note: calculate the differences as non-pet owners minus pet owners.) Which of the following are true statements?

Select one or more:

- ☐   The 90% confidence interval is (-0.016, 0.104).
- ☐   The 90% confidence interval is (-0.001, 0.090).
- ☑   The 90% confidence interval is (0.006, 0.083). ✔
- ☑   We are 90% confident that the true difference in proportions is in the interval we calculated. ✔
- ☑   We believe that 90% of future samples pet owners and non-pet owners will have a difference in proportions that is in the interval ✘ we calculated.

Your answer is partially correct.

You have selected too many options.
The correct answers are: The 90% confidence interval is (0.006, 0.083)., We are 90% confident that the true difference in proportions is in the interval we calculated.

Question **8**

Correct

1.00 points out of 1.00

Which conditions are necessary for the confidence interval in the previous question to be valid?

Select one or more:

☑ Both samples large $(n_1\hat{p}_1,\, n_1(1-\hat{p}_1),\, n_2\hat{p}_2,\, n_2(1-\hat{p}_2)$ each at least 10) ✔

☐ Both samples large $(n_1,\, n_2$ each at least 30)

☐ Both populations normal.

☑ Both samples random. ✔

☑ Samples independent of each other ✔

Your answer is correct.

The correct answers are: Both samples random., Both samples large $(n_1\hat{p}_1,\, n_1(1-\hat{p}_1),\, n_2\hat{p}_2,\, n_2(1-\hat{p}_2)$ each at least 10)
, Samples independent of each other

Question **9**

Correct

1.00 points out of 1.00

A 2011 Sleep in America Poll surveyed a random sample of U.S. residents about their sleeping habits. Of the 469 individuals ages 30-45 years old (Gen-X), 50% reported using the Internet in the hour before trying to fall asleep at least a few nights a week. In contrast, 70% of the 293 individuals aged 19-29 (Gen-Y or Millennials) reported Internet use before sleep. Calculate the test statistic that would be used to test the hypothesis that those in Gen-X are less likely to use the Internet before sleep than those in Gen-Y. (Calculate the differences as Gen-X minus Gen-Y).

Round your answer to 2 decimal places.

Answer: | -5.72 | ✔

The correct answer is: -5.66

◄ Optional Additional Practice

Jump to...

Note Outline 8: Inference for More than Two Groups ►