

### PSYC 003 Homework 5

A scientist suspects that the use of imagery versus no imagery leads to a different number of memories being recalled. For the study, the scientist matched participants into pairs based on intelligence and age. Then, one member of each pair was randomly assigned to the imagery condition. The remaining member of the pair was placed into the no imagery condition. Each participant was then asked to recall words from a list either with imagery or no imagery (depending on the condition). The data below represent the number of words recalled from the list for all participants. The scientist is willing to tolerate an error rate of 5%.

Pair	With Imagery	No Imagery
1	14	8
2	15	11
3	9	7
4	16	10
5	9	9
6	7	8

1. *State the Statistical Hypotheses:*

$H_0$ :

$H_A$ :

2. *Select the Appropriate Statistical Test and Identify the significance level ( $\alpha$ ):*

3. *What type of design does this study employ:*

4. *Describe the Sample (Be sure to include the number of difference scores and any relevant sample characteristics):*

5. *Rejection Region (Be sure to draw the picture, clearly label the critical value, and identify the value of degrees of freedom if applicable):*

6. *What is the appropriate indicator of variability to be used for the test statistic and calculate its value:*

*Calculate Test Statistic:*

7. *Make the Statistical Decision:*

8. *Write the interpretation:*

A computer company claims that their new keyboard is designed for faster typing. In a pilot study, six randomly selected students who were taking an administrative assistant training typed the same material on both the new and an old keyboard. Given the words per minute scores below, conduct the appropriate null hypothesis significance test on these data. The computer company will tolerate an error rate of 1%.

Participant	1	2	3	4	5	6
New Keyboard	52	56	55	65	67	63
Old Keyboard	48	56	49	68	66	59

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6. *What is the appropriate indicator of variability to be used for the test statistic and calculate its value:*

*Calculate Test Statistic:*

7. *Make the Statistical Decision:*

8. *Write the interpretation:*

A researcher wishes to test the hypothesis that knowledge about popular music at University A is different than the general population of college-aged students, who score 12 questions correct on a music knowledge quiz. The researcher obtains a random sample of 41 students from University A. The mean of this sample is 15 and the standard deviation is  $s = 6$ . The researcher will tolerate a Type I error rate of 1%.

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3. *What type of design does this study employ:*

4. *Describe the Sample (Be sure to include the number of participants and any relevant sample characteristics):*

5. *Rejection Region (Be sure to draw the picture, clearly label the critical value, and identify the value of degrees of freedom if applicable):*

6. *Calculate Test Statistic:*

7. *Make the Statistical Decision:*

8. *Write the interpretation:*

A researcher wonders whether adults who have spent 6 months or more overseas are more creative than the general population. On the tasks that researchers typically use to assess creativity, the general population shows an average of 4 with a standard deviation of  $\sigma = 2$ . A sample of 15 adults who have spent 6 months or more overseas shows creativity of 5 and a standard deviation of  $s = 1.5$ . The researcher will tolerate a Type I error rate of 5%.

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4. *Describe the Sample (Be sure to include the number of participants and any relevant sample characteristics):*

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6. *Calculate Test Statistic:*

7. *Make the Statistical Decision:*

8. *Write the interpretation:*