

### PSYC 003 Exam 3

A drug company is interested in seeing how their new drug Euphoria compares to the most common anti-depressant on the market for individuals suffering from mild depression. In a pilot study, 7 mildly depressed individuals self-reported their level of depression on a scale from 30 (not at all depressed)-80 (highly depressed), for one month while they were taking the common anti-depressant and then for one month while they were taking Euphoria. Conduct the appropriate null hypothesis significance test on these data. The drug company will tolerate an error rate of 5%.

	Common Anti-Depressant	Euphoria
1	52	48
2	48	47
3	39	32
4	50	46
5	53	50
6	47	43
7	41	39

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. *(worth 2 points) What is the appropriate indicator of variability to be used for the test statistic and calculate its value. Be sure to show your work:*

*Calculate Test Statistic. Be sure to show your work, including equations used, in order to receive full credit:*

7. *Make the Statistical Decision:*

8. *Write the interpretation:*

William Sealy Gossett was working for the Guinness Brewing Company in 1918 and wanted to see if the latest batch of beer he had made had a different level of alcohol than the population of beers previously made. Guinness, over the years, has had an average of  $\mu = 7.5$  parts per hundred of alcohol. He takes 14 random samples from his new batch of beer and finds they have  $\bar{X} = 7.2$  parts per hundred of alcohol with  $s = 0.6$ . Gossett will tolerate a 1% error rate.

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 **both 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(s) of degrees of freedom if applicable):*

6. *(worth 2 points) Calculate Test Statistic (Be sure to show your work, including equations used, in order to receive full credit):*

7. *Make the Statistical Decision*

8. *Write the Interpretation:*

An industrial psychologist questions if there is any effect of different types of motivation on the performance of simulated clerical tasks. 20 college students were randomly assigned into two groups. The 10 participants in the “individual motivation” sample are told that they will be rewarded according to how many tasks they successfully complete. The 10 participants in the “group motivation” sample are told that they will be rewarded according to the average number of tasks completed by all the participants in their sample. The number of tasks completed by each participant are as follows:

Individual Motivation: 11, 17, 14, 10, 11, 15, 10, 9, 12, 15

Group Motivation: 10, 15, 14, 8, 8, 14, 6, 7, 11, 13

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 **both** 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(s) of degrees of freedom if applicable):*

6. (worth 2 points) Calculate Test Statistic (Be sure to show your work, including equations used, in order to receive full credit):

7. Make the Statistical Decision

8. Write the Interpretation:

A researcher in veterinarian medicine believes that mixed-breed dogs have fewer serious illnesses during their lives than pure-breed dogs. It is known that, in the population, the standard deviation for mixed-breed dogs is  $\sigma = 3.5$ , whereas for pure-breed dogs, the standard deviation is  $\sigma = 3.2$ . The researcher randomly samples records from 31 mixed-breed dogs and finds that their number of serious lifetime illnesses is ( $\bar{X} = 2.5, s = 3.0$ ), whereas a random sample of 30 pure-breed dogs has ( $\bar{X} = 2.9, s = 3.3$ ) serious lifetime illnesses. The researcher will tolerate a Type I Error Rate of 1%.

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 **both** 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(s) of degrees of freedom if applicable):*

6. *(worth 2 points) Calculate Test Statistic (Be sure to show your work, including equations used, in order to receive full credit)*

7. *Make the Statistical Decision*

8. *Write the Interpretation:*