

AS1(Assignment 1, Unit 5) Independent Measures t-test

Please write your responses in red 😊

A pharmaceutical company wishes to test the effects of a herbal supplement on anxiety levels. The researcher randomly selects a sample of $n=16$ adults from Essex County. The sample is randomly assigned to either the herbal supplement, Group B or a placebo, Group A.

Here are the data:

GROUP "A"	GROUP " B "
12, 16, 18, 21,	13, 18, 20, 16
17, 18, 18, 19	19, 21, 19, 22

1. What is the researcher's hypothesis?

An herbal supplement will have an effect on anxiety levels.

2. What is the null hypothesis?

An herbal supplement will NOT have an effect on anxiety levels.

3. What is the independent variable? The Cause: Herbal supplement

4. What is the dependent variable? The effect: Anxiety levels

5. What is the name of the *research design* in this study?

Randomly selects a sample (The Between-Subject Research Design)

6. What is the appropriate *hypothesis test* to analyze the data from this study?

The Independent-Measures t-test

7. What are the two mean "differences" you are analyzing in these data?

No comparison

8. What is the definition of a random assignment?

Everyone in the sample will have an equal chance of being in either the control group or the experimental group.

9. Why is using a random sample important in this study?

Because it allows the researcher **to assume** that the sample **represents** (looks like the population).

10. If a researcher failed to use random assignment, how would this affect the research conclusion?

The researcher could NOT assume that the ONLY difference between the groups is the independent variable. If the ONLY difference is the independent variable, then the researcher CAN conclude that the IV is the CAUSE of the observed effect. BUT, if random assignment is NOT used, and OTHER variables (other than the independent variable) also differ between the groups, then ANY other of those variables could also be the CAUSE of the observed effect. Basically, this is another way to be sure about cause and effect.

11. If a researcher failed to use a random sample, how would this affect the research results?

The researcher will not be able to generalize the results of a study conducted on a sample back to the population

12. Run the appropriate SPSS analysis on the data and cut and paste your SPSS results here:

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1.00	8	17.3750	2.61520	.92461
	2.00	8	18.5000	2.87849	1.01770

Independent Samples Test

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	Sig. (2-tailed)
VAR00001	Equal variances assumed	.149	.705	-.818	14	
	Equal variances not assumed			-.818	13.873	

13. Based on your SPSS results, please answer the following questions:

(a) What is the appropriate decision, reject the null or fail to reject the null? **Reject Ho**

(b) Write the “statistical statement” of your SPSS analysis: **$t(14) = -.818, P < .05$**

(c) Please write your results as they might be written in a research study (refer to the “In the Literature” section of chapter 10 of your textbook).

The mean for GROUP A was 17.3 with a S.D of 2.61. Therefore, the mean for GROUP B was 18.5 with a S.D of 2.87. There was a significant difference between the groups. $T(14) = -.818, P < .05$. Type 1 Error.

(d) Is there a probability of Type I error? **Yes** _____ **No** _____

(e) Is there a probability of Type II error? **Yes**_____ **No**_____