

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 level.

2. What is the null hypothesis?

An herbal supplement will not have an effect on anxiety level.

3. What is the independent variable?

The herbal supplement

4. What is the dependent variable?

The anxiety levels

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

Between-Subject Research Design

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

Independent-Measures T-Test

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

Sample mean of group A and sample mean of group B

8. What is the definition of a random assignment?

Everyone in the sample has an equal chance of being put in the control group or in the experimental group

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

It's important to use a random sample in order for each participant to have an equal opportunity of being included in the sample by random chance to have the most accurate results.

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

Then the researcher could not assume that the only difference between the groups is the independent variable. There could be outside factors that can influence the results.

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

Then the researcher could not assume that the only difference between the groups is the independent variable. There could be outside factors that can influence the results.

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		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
VAR00001	Equal variances assumed	.149	.705	-.818	14	.427	-1.12500	1.37500	-4.07408	1.82408
	Equal variances not assumed			-.818	13.873	.427	-1.12500	1.37500	-4.07661	1.82661

T = - 0.818 df = 14

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 the null hypothesis**

(b) Write the “statistical statement” of your SPSS analysis: **t (14) = - 0.818, p < 0.05**

(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 the group that took the herbal supplement was M = 17.3750 with a SD = 2.61520. The mean for the group that took the placebo was M = 18.5 with a SD = 2.87849. There was a significant difference between the groups, t (14) = - 0.818, p < 0.05.

(d) Is there a probability of Type I error? **Yes**

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