

AS4 (Assignment 4, Unit 5)

SECTION I:

A randomized study on n=50 rats tested whether living in a crowded situation had an effect on stress levels. Based on this information, please answer questions 1-6

1. What is the researcher's hypothesis?

The researcher's hypothesis study on if 50 rats are placed living in a crowded situation then they had an effect on stress levels.

2. What is the null hypothesis? The Null hypothesis test that the crowded situations doesn't cause the effect of stress. The Null hypothesis test that if 50 rats are placed living in a crowded situation then they had no effect on stress levels.

3. What is the independent variable? The crowd of rats living in a crowded situation.

4. What is the dependent variable? Stress levels

5. What research design appears apparent here? Within Subject design

6. What is the appropriate hypothesis test? INDEPENDENT MEASURES t-test

A researcher wishes to know whether a newly developed teaching method has an effect on 5th grading reading scores. A sample of 5th graders are given a standardized test at the beginning of the school year and retested at the end of the school year. Based on this scenario, answers questions 7-12.

7. What is the researcher's hypothesis? The researcher hypothesis wish to know that newly develop teaching method has an effect on 5th grading reading scores.

8. What is the null hypothesis? The Null effect wish to know that newly develop teaching method has no effect on 5th grading reading scores.

9. What is the independent variable?

Teaching Method

10. What is the dependent variable? _

Reading Score

11. What is the name of the "research design?"

Experimental Study Design

12. What is the appropriate hypothesis test to analyze the data from this study? **Dependent measure t - test**

SECTION II:

13. What is the definition of a random sample? **The definition of a random sample is that everyone in the population has an equal chance to be selected for the sample.**

14. What is the definition of random assignment? **Random assignment is a cornerstone of experimental design for reasons that I hope will soon become clear.**

15. Imagine that the researcher failed to use a random sample. How would this failure limit her study's conclusions?

The research wouldn't be able to generalize the results of a study conducted on a sample back to the population.

16. Imagine that the researcher failed to use random assignment in her study. How would this limit her research conclusions?

there will be no comparison for the sample mean; therefore, the researcher has to come up with his or her own comparison.

17. No matter what hypothesis test you are using, there are two basic "differences" that you are analyzing in ALL hypotheses tests. What are these two "differences"?

1. **_To test difference between population means and variances.**

2. **To test difference of population proportion.**

18. What is meant by the term "statistical significance"? **the result observed in a sample is unusual when the null hypothesis is assumed to be true.**

SECTION III:

A researcher tested whether drinking caffeine had an effect on anxiety. Below is an SPSS printout from an “independent measures t-test for the data he collected:

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1.00	6	4.8333	1.16905	.47726
	2.00	6	8.3333	.81650	.33333

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	.537	.481	-6.012	10	.000	-3.50000	.58214	-4.79709	-2.20291
	Equal variances not assumed			-6.012	8.940	.000	-3.50000	.58214	-4.81824	-2.18176

19. Please write the “statistical statement” for the above SPSS results:

Answer: $t(10) = -6.012, p < .05$

20. What decision did you make at end of this test? REJECT Ho

21. Are the data significant? Yes * or No _____

22. Please write up the complete results for the above test:

The mean of anxiety before drinking coffee was $M = 4.833$, with a standard deviation of $.81650$ and the mean of anxiety after drinking coffee was $m = 8.333$, with a standard deviation of 1.16905 ; Our data was significant. Caffeine did have an effect on anxiety. The statistical statement is $t(10) = -6.012, p < .05$.

A researcher tested whether a particular lecture would have an effect on motivation. Below is an SPSS printout of a Paired Samples Test she used to analyze her data:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	VAR00001	4.1250	8	1.45774	.51539
	VAR00002	5.0000	8	2.00000	.70711

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00001 - VAR00002	-.87500	2.10017	.74252	-2.63079	.88079	-1.178	7	.277

22. Please write the “statistical statement” for the above SPSS results:

Answer: $t(7) = -1.178, p > .05$ _____

23. Did you reject or fail to reject the null hypothesis? **Refuse to reject**
HO _____

24. Is this a within or between subject design? Yes _____

25. Are the data significant? Yes _____ No * _____

26. Is there a probability of Type I Error? Yes _____ No * _____

27. Please write up the research results for the above:

Variance 1 has a $m = 4.1$, with a $std = 1.45$; Variance 2 has $m = 5.00$, with a $Std = 2.000$ The data failed to reach significance. The statistical statement is $t(7) = -1.178, p > .05$