

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?
A study on n=50 rats tested whether living in a crowd situation has an effect on stress levels.
2. What is the null hypothesis?
A study n=50 rats tested whether living in a crowd situation has NO effect on stress levels.
3. What is the independent variable? n=50 rats placed living in a crowded situation
4. What is the dependent variable? Stress Levels
5. What research design appears apparent here? Between-Subject Design
6. What is the appropriate hypothesis test? The independent two sample 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?
A newly developed teaching method has an effect on 5th grade reading scores.
8. What is the null hypothesis? A newly developed teaching method has NO effect on 5th grade reading scores.
9. What is the independent variable? A newly developed teaching method.
10. What is the dependent variable? 5th grading reading scores
11. What is the name of the "research design? Within-subject research / repeated measures design
12. What is the appropriate hypothesis test to analyze the data from this study? Dependent Measures t-test

SECTION II:

13. What is the definition of a random sample?

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 assigns participants into 2 groups, the control group and the experimental group randomly.

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

The researchers want to study populations, but cannot study the population directly, therefore the researchers study samples. It allows the researchers to assume that the sample represents (looks like the population). This assumption is what allows the researchers to be able to "generalize" the results of a study conducted on a sample back to the population: to say that what was true of the sample findings is also true of the population.

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

The researcher will not be able to establish a cause-and-effect relationship between the independent variable and the dependent variable.

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. The difference in Mean

2. The difference in variation

18. What is meant by the term "statistical significance"?

Statistical significance refers to the claim that a result from data generated by testing or experimentation is likely to be attributable to a specific cause.

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 the end of this test? **Fail to reject the null hypothesis. There is NO effect on whether drinking caffeine has an effect on anxiety.**

21. Are the data significant? Yes ___ or No **X**__

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

Placebo group 1 M = 4.8 with a SD= 1.17 and Group 2 M = 8.3 with a SD = .81 The data failed to reach significance that there is an effect on whether drinking caffeine has an effect on anxiety.

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? **Reject the null hypothesis.**

24. Is this a within or between subject design? **Within- subjects design**

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

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

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

Group 1 M = 4.12 with a SD = 1.4 and Group 2 M = 5.0 with a SD = 2.0

There is sufficient evidence to conclude that the lecture would have a particular effect on motivation.