

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?

_____ Living in a crowded situation will have an effect on stress levels in rats.

2. What is the null hypothesis?

_____ Living in a crowded situation will not have an effect on stress levels in rats.

3. What is the independent variable? _____ a crowded situation (placing rats in a smaller experimental habitat) _____

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? _____ 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 new teaching method will have an effect on reading scores.

8. What is the null hypothesis?

___ The new teaching method will not have an effect on reading scores.

9. What is the independent variable? _____ new teaching method _____

10. What is the dependent variable? _____ reading scores _____

11. What is the name of the “research design? ___ **within-subject 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?

___ **everyone in the population has an equal chance to be selected for the sample.**

14. What is the definition of random assignment?

___ **everyone in the sample has an equal chance of being placed into the control group or the experimental group.**

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

___ **The sample will not represent the population; thus, the researcher will not be able to generalize results of the study back to the population of interest.**

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

___ **The researcher would not be able to assume that the only difference between groups is the independent variable. It would be impossible to conclude that the independent variable is the cause of the effect. The researcher wouldn’t be able to attribute the cause to the independent 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. differences between means because of the IV

2. differences between means due to error

18. What is meant by the term “statistical significance”?

the results of a research studies are not a random (just by chance) event, but rather the results that can be attributed to the IV.

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: $t(10) = -6.012, p < 0.05$

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 anxiety level without drinking caffeine was $M=4.8333$ with $SD=1.16905$. The mean anxiety level drinking caffeine was $M=8.3333$ with $SD=0.81560$. The data is significant. $t(10) = -6.012, p < 0.05$

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: $t(7) = -1.178, p > 0.05$

23. Did you reject or fail to reject the null hypothesis? failed to reject H_0

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

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:

The mean level of motivation before the lecture was $M=5$ with $SD=2$. The mean level of motivation after the lecture was $M=4.125$ with $SD=1.45774$. Our data was insignificant. Our data doesn't support that the lecture had an effect on motivation. $t(7) = -1.178, p > 0.05$
