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? 50 rats living in a crowded situation had an effect on stress levels.

2. What is the null hypothesis? 50 rats living in a crowded situation had NO effect on stress levels.

3. What is the independent variable? The Cause: living in a crowded situation

4. What is the dependent variable? The effect: Stress Level

5. What research design appears apparent here? the between-subject two-group design

6. What is the appropriate hypothesis test? the 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? A newly developed teaching method has an effect on 5th grading reading scores.

8. What is the null hypothesis? A newly developed teaching method has NO effect on 5th grading reading scores.

9. What is the independent variable? Cause: a newly developed teaching method

10. What is the dependent variable? Effect: 5th grading reading scores

11. What is the name of the "research design? the 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 will have an equal chance of being in either 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 researcher will not 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?

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.

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"?

l. the experimental group mean

2. The control group mean

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

A measure of the probability of the null hypothesis being true compared to the acceptable level of uncertainty regarding the true answer. For example, if the p-value is less than 0.05 (Alpha), then I can say that my observation is statistically significant.

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						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error 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 for group A was 4.83 with a SD=1.16. The mean for group B was 8.33 with a SD= .816. Our data were not 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? Fail to reject Ho

24. Is this a within or between subject design? A 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 before lecture was 5.00 with a SD= 2.00. The mean after lecture was 4.12 with a SD= 1.45. Our data were significant. t(7)=-1.178,P>0.05

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