

AS4 (Assignment 4, Unit 5)

SECTION I:

A randomized study on n=25 10-year-olds tested whether classrooms that had more than 30 students had an effect on academic performance. Based on this information, please answer questions 1-6

1. What is the researcher's hypothesis?

Classrooms that had more than 30 students will have an effect on academic performance

2. What is the null hypothesis?

Classrooms that had more than 30 students will not have an effect on academic performance

3. What is the independent variable? Number of students in classroom

4. What is the dependent variable? Academic performance

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?

A newly developed teaching method will have an effect on 5th grade reading scores

8. What is the null hypothesis?

A newly developed teaching method will not have an effect on 5th grade reading scores

9. What is the independent variable? Teaching method

10. What is the dependent variable? Reading scores

11. What is the name of the "research design? Within the subject's design

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

A dependent-measures t-test, also a paired t-test

SECTION II:

13. What is the definition of a random sample?

A random sample is everyone in the population has an equal chance to be selected for the sample

14. What is the definition of random assignment?

A random assignment is each participant has an equal chance of being assigned to each of the treatment conditions.

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

If a researcher failed to use a random sample the first failure would be lack of representation of the population and this would cause statistics to be false or biased.

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

If a researcher failed to use random assignment in her study, she would not be able to control the confounding variables and then the researcher would not be able to isolate the causal variable

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

1. The null hypothesis
2. The researcher's hypothesis

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

What is meant by the term "statistical significance" is that the results of the data are not by chance alone. A p-value of .05 or lower is statistically significant.

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	7	4.5714	.97590	.36886
	2.00	7	4.7143	.75593	.28571

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	.485	.499	-.306	12	.765	-.14286	.46657	-	.87371
									1.15942	
	Equal variances not assumed			-.306	11.294	.765	-.14286	.46657	-	.88080
									1.16652	

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

Answer: $t(12) = -.306, p > .05$

20. What decision did you make at end of this test? **Fail to reject the null hypothesis**

21. Are the data significant? Yes _____ or No

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

The mean in drinking caffeine was $M=4.57$ with a $SD = .975$. The mean for not drinking caffeine was $M=4.71$ with a $SD = .755$. The data failed to reach significance between the groups, $t(12) = -.306, p > .05$

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	3.6000	5	.89443	.40000
	VAR00002	5.4000	5	.89443	.40000

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	-1.80000	1.09545	.48990	-3.16017	-.43983	-3.674	4	.021

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

Answer: $t(4) = -3.674, p < .05$

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 subject's 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 for the lecture was $M = 3.600$ with a $SD = .89443$. The mean for the effect on motivation was $M = 5.4000$ with a $SD = .89443$. Our data was significant. Our data supports that the lecture had an effect on motivation, $t(4) = -3.674, p < .05$.