

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 researchers hypothesis is that living in a crowded living situation will have an effect on the rats

2. What is the null hypothesis?

The null hypothesis is that living in crowded living conditions will have no effect on the rats

3. What is the independent variable? The living conditions

4. What is the dependent variable? The stress levels of the rats

5. What research design appears apparent here? Between-subjects

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 researchers hypothesis is that the newly developed teaching method will have an effect on the 5th grade reading scores

8. What is the null hypothesis?

The null hypothesis is that the newly developed teaching method will have no effect on the 5th grade reading scored

9. What is the independent variable? The standardized test

10. What is the dependent variable? The newly developed teaching method

11. What is the name of the "research design? Within-subjects

12. What is the appropriate hypothesis test to analyze the data from this study? Dependent measures, or paired samples, 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 put 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 used would not accurately represent the general population they wish to study.

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

It jeopardizes the assumption that both groups are equal on all individual variables. Without this, there can be differences in the groups besides the independent variable, so the conclusions would be inaccurate if other variables were in 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"?

1. Between means because of the IV

2. Differences due to error

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

The probability of the null hypothesis being 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:

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**

21. Are the data significant? Yes_____ or No x

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

The mean anxiety levels before drinking caffeine was $M=4.83$, with a $SD=1.169$. The mean anxiety levels after drinking caffeine was $M=8.333$, with a $SD=0.817$. The data failed to reach significance. The results supported that drinking caffeine does have 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:

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? **Fail to reject**

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

25. Are the data significant? **Yes x** No_____

26. Is there a probability of Type I Error? Yes_____ **No x**

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

The mean for group 1 was $M=4.125$, with a $SD=1.458$. The mean for group 2 was $M=5$, with a $SD=2$. The data did reach significance. The results supported that the particular lecture had no effect on motivation.