

SAMPLE COMPREHENSIVE EXAMINATION QUESTIONS – STAT 1

A group of faculty across the university were concerned that graduate students assigned to be teaching assistants (TA's) were at a disadvantage in their academic growth as a result of graduate study because of the time demands of teaching. To test this hypothesis, they randomly selected 23 students who had been teaching assistants (TA's – Group 1) and 20 students that had not had teaching assistantships (Group 2). Each of these students responded to a questionnaire designed to measure their perceptions of growth in a variety of areas as a result of their graduate study. A composite score was calculated for each student. The researchers thought that if TA's were disadvantaged, they would perceive less growth than students who had not been TA's. The attached SPSS printout shows the analysis of the data. From the information provided in the printout, answer the following questions. Use $\alpha = .05$ for all statistical tests.

- (a) What is the independent variable for this study?
- (b) What is the dependent variable for this study?
- (c) One of the first things to do in the analysis of data is to check to see if the data meet the assumptions for the use of the statistical method. On the printout is Levene's Test for Equality of Variances. This tests the assumption of homogeneity of variance.
 1. What does homogeneity of variance refer to?
 2. Is the assumption of homogeneity of variance met with these data?
 3. What specific information on the printout did you use to come to this conclusion?
- (d) For the t-test for equality of means, there are two t-values: one associated with "equal variances assumed", and the second associated with "equal variances not assumed".
 1. Which one would you report?
 2. Why do you choose that one?
 3. What hypothesis is being tested with the t-test?
- (e) Is there evidence to support the researchers' hypothesis that TA's are disadvantaged? Explain your rationale for your answer.
- (f) Can the researchers claim that the type of assistantship experience caused the results of this study?
- (g) To whom can these results be generalized?

1. Below are listed pairs of statistical terms. Compare and contrast each pair:
 - (a) Descriptive statistics - Inferential statistics
 - (b) Independent t-test - Dependent t-test
 - (c) Independent variables - Dependent variable

2. For each of the following scenarios, determine an appropriate statistical analysis that could be used to address the problem:
 - (a) A school reform researcher was interested in determining whether two school reform models were equally effective. It was decided to compare the average TCAP scores of students attending schools that adopted Model A to those of students attending schools that adopted Model B.
 - (b) The mathematics department of a university was asked to provide evidence that their placement test was a good predictor of students' mathematics grades.
 - (c) The university counseling center wanted to test the effectiveness of a study skills tutorial by giving the students a pre-test, conducting a study skills seminar, and then administering a post-test.

T-TEST

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GROUPS = rata(1 2)
/MISSING = ANALYSIS
/VARIABLES = growth
/CRITERIA = CI(.95) .
    
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T-Test

Group Statistics

growth	rata	N	Mean	Std. Deviation	Std. Error Mean
1.00	ta	16	14.1250	4.97829	1.24457
2.00	no ta	16	8.2500	3.45447	.86362

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
growth	Equal variances assumed	3.488	.072	3.878	30	.001	5.87500	1.51486	2.78125	8.96875
	Equal variances not assumed			3.878	26.726	.001	5.87500	1.51486	2.76528	8.98472