

PSYC 60 – Statistics
Spring 2012
Quiz 3 – A

Name: _____

Signature: _____

Student #: A_____

Instructions

Calculators (simple & graphing) will be allowed along with one page with both sides of handwritten notes. You will receive a copy of the z- and t-table with this quiz. You will have the full class period (50 minutes minus setup time).

Test selection

For questions 1-4, select the appropriate statistical method from below for each described scenario.

- a. z-test
- b. t-test – 1 sample
- c. t-test – 2 sample, dependent
- d. t-test – 2 sample, independent
- e. confidence interval

1. A produce manager with an unusual interest in statistics wants to determine which suppliers' fruit goes bad sooner. She takes a sample of a dozen apples from two different suppliers and records the number of days before each goes bad. (select the appropriate method from the list above)

2. The IRS releases information on how much the US population pays in taxes with a mean of \$8.5K. The Huffington Post gathers tax data on U.S. Senators to determine if they pay less than the population. (select the appropriate method from the list above)

3. A psych graduate student is testing the effect of room color on memory performance. She has each subject memorize and recall a word list in a dark brown room and a bright yellow room. Participants perform both tests on the same visit, randomly alternating which room they do first. (select the appropriate method from the list above)

4. A geneticist gathers red blood cell counts from 10 mice and wants to estimate the true range of red blood cell counts in the population of mice. (select the appropriate method from the list above)

t Test, 2-sample - Dependent

Questions 5-8 use the following information:

The DMV gathers data on whether people have a higher (better) score in a driving simulator for hands-FREE cell phone use versus hands-ON cell phone use. Each driver participates in both conditions. Perform a 1-tailed t-test to determine if HANDS-FREE has a higher score. Assume $\alpha = 0.05$.

ID	FREE	ON	FREE minus ON
A:	18	14	?
B:	19	19	?
C:	17	15	?
Avg.	18	16	?
SS	2	14	8

5. What are the degrees of freedom?

- a. 1
- b. 2
- c. 3
- d. 5
- e. 6

7. What is the critical t value?

- a. 2.015
- b. 2.353
- c. 2.920
- d. 3.182
- e. 4.303

6. What is the standard error? (you must decide which standard error is appropriate for this test)

- a. 0.58
- b. 1.53
- c. 1.15
- d. 2.67
- e. 4.0

8. What is the calculated t value?

- a. 0.75
- b. 0.89
- c. 1.00
- d. 1.74
- e. 2.10

t Test, 2-sample - Independent

Questions 9-10 used the following information:

Given the following information on two independent samples:

	Mean	s (not SS)	n
A	2.4	1.2	22
B	3.2	1.5	8

9. What are the degrees of freedom?
- 28
 - 29
 - 30
 - 31
 - 32
10. What is the pooled variance?
- 1.35
 - 1.64
 - 1.85
 - 46.00
 - 16.23
11. What does the pooled variance represent?
- How much sample A differs from sample B
 - How similar sample A is to sample B
 - The variance of the populations that samples A and B came from
 - How much the samples means are likely to deviate from the populations
12. What advantage does the $n_1=n_2$ shortcut provide?
- it converts an independent t- test to a dependent t-test
 - pooled variance does not have to be calculated
 - standard error of the difference in sample means does not have to be calculated
 - the difference in sample means is assumed to be zero
13. If the pooled variance is 12, what is the standard error of the difference in sample means if the sample sizes are 4 and 5?
- 1.15
 - 1.33
 - 1.71
 - 2.32
 - 3.46
14. Which of the following would increase the chance that the difference between two sample means is closer to the true difference in population means?
- Increase the difference in population means
 - Increasing the sample size of either sample
 - Increasing the variance of the populations
 - None of the above

15. Why do we need standard error?

- a. It describes the variability within a sample
- b. It defines how much samples deviate from populations by chance
- c. It measures the difference between a sample and the population

16. What is the t statistic for the following information on two independent samples? (use Sample A - Sample B and test the null hypothesis: $\mu_A = \mu_B$)

	<u>Mean</u>	<u>var</u>	<u>n</u>
Sample A	80	16	8
Sample B	84	20	8

- a. Between -1.0 and -1.5
- b. Between -1.5 and -2.0
- c. Between -2.0 and -2.5
- d. Between -2.5 and -3.0
- e. Less than -3.0

Conceptual

Questions 17-18 are based on the following experiment:

A psychology professor is studying how the volume of background noise affects the time it takes for subjects to solve simple puzzles. Before the experiment, the professor took his subject list and flipped a coin for each subject to assign them to either the first or second week. In the first week, subjects solve puzzles in a room with noise produced by a small fan. In the second week, a different set of subjects solved puzzles with noise produced by a jackhammer next door. The data showed worst performance for the jackhammer condition.

17. Which of the following correctly labels the variables?

- a. IV = amount of noise, DV = time to solve puzzles
- b. IV = amount of noise, DV = which week the subjects participated
- c. IV = time to solve puzzles, DV = amount of noise
- d. IV = time to solve puzzles, DV = which week the subjects participated

18. What did the professor fail to do?

- a. Random assignment
- b. Counterbalance
- c. Manipulation
- d. Experimentation

19. Which study can correctly claim it is studying causation and not just correlation?
- A review of weather & traffic data claims that colder weather causes slower driving.
 - An observational study claims that older age causes greater donations to charities
 - A clinical drug trial claims that drug instead of placebo causes better disease outcomes
 - An independent t-test claims that attendance of UCSD versus SDSU causes higher IQ
20. Review: what does alpha help us find?
- The likelihood of getting a given sample result
 - A criteria value that a sample must beat to be considered significant
 - The size of an effect
 - The likelihood that the alternative hypothesis is true
 - The variability of a population

Extra Credit (each worth +2.5%)

21. Which 2-sample test is more sensitive?
- the independent because it has more information (df)
 - the independent because it has less extreme critical values
 - the dependent because it has less variability
 - the dependent because it has larger effect sizes
22. The calculated t value in a 2-sample independent test measures:
- the difference between sample means
 - the difference between population means
 - how rare the difference in sample means is
 - how much sample means differ by chance