

# Introduction to Statistics in Psychology: PSY 201

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<http://www.psych.purdue.edu/~gfrancis/Classes/PSY201/indexF23.html>

## Study Guide for Exam 3

*Exam Date: November 17, 2023 (during the regular class period)*

The exam will consist of 10 short-answer questions that will either involve some computation or will require a short essay to explain a concept in statistics. Drawings, graphs, and examples are often helpful when answering an essay question. For computations, you can receive partial credit as long as you show your work. Bring a calculator.

For this exam, you should prepare an “information sheet” that you can bring with you to the exam. On a single  $8.5 \times 11$  sheet of paper, you can write (hand written only) anything you think might be helpful. You can use both sides of the paper. Since any information you need can be on your sheet, the exam will not include a listing of equations.

For all hypothesis tests, confidence intervals, and power calculations: you need to know how the test is set up, how to get values for the power analysis, and how to interpret the outcomes. These are conceptual issues that apply to all statistics.

## Chapter 11

1. Know the shape, mean, and standard deviation of the sampling distribution of a proportion,  $p$ .
2. Know when the normal distribution approximation to the binomial is generally considered “good enough.”
3. Know how to do a hypothesis test for a one-sample proportion.
4. Know how to compute the confidence interval of a proportion.
5. Know how to compute power for a hypothesis test for a one-sample proportion.
6. Understand in general terms, why the sampling distribution of  $r$  is skewed.
7. Understand in general terms the need for the  $z$  transform of  $r$  values. Know the sampling distribution of the  $z_r$  values.
8. Know the mean and standard error of the  $z_r$  sampling distribution.
9. Understand the need and purpose of the Fisher’s  $z_r$  transformation for correlations.

10. Know how to do a hypothesis test for a one-sample correlation.
11. Know how to compute the confidence interval of a correlation ( $r$ ) using the Fisher's  $z_r$  transformation.
12. Know how to compute power for a hypothesis test for a one-sample correlation.

## Chapter 12

1. Know how to perform a hypothesis test for the difference of two independent means when the sample sizes are the same.
2. Know what assumptions are needed to do the hypothesis test for the difference of two independent means. Know what happens to the Type I error rate when these assumptions are violated.
3. Know how to perform a hypothesis test for the difference of two independent means when the sample sizes are different.
4. Know how to compute a confidence interval for the difference of two independent means.
5. Know how to compute power for a hypothesis test for the difference of two independent means.
6. Be able to perform a hypothesis test for the difference between dependent means (correlated pairs).
7. Be able to build a confidence interval for the difference between dependent means (correlated pairs).
8. Be able to compute power for a hypothesis test of the difference between dependent means (correlated pairs).
9. Understand the relationship between hypothesis test of dependent means and a one-sample test of the mean.

## Chapter 13

1. Know how to do a hypothesis test, calculate power, and build a confidence interval for a difference of two sample proportions with independent samples.
2. Know how to do a hypothesis test, calculate power, and build a confidence interval for a difference of two sample proportions with dependent samples.
3. Know how to do a hypothesis test and calculate power for a difference of two sample correlations with independent samples.