For this project, you will be gathering quantitative data from two groups in order to make inferences about the populations from which these groups come from. After you gather your data, you will describe each variable separately. Then, you will construct 95% confidence intervals for each group and perform a two-sample t-test or a matched-pairs/paired t-test, depending on the kind of data you have collected.

Step 1. Coming up with an idea

Often, one of the most difficult parts of the research process is coming up with an idea! To make the project meaningful, try to think of something that you would be interested in knowing about. Just keep in mind that you will be gathering quantitative data from two independent groups.

To help you brainstorm, consider some of these ideas…

- Do college females have higher grade point averages than college males?
- Do college males sleep a different number of hours each night than college females?
- Do cereals placed on the top shelf at the grocery store cost more than cereals placed on the bottom shelf?
- Do magazines aimed at a male audience cost less than magazines aimed at a female audience?
- Is the mean income per household greater for people living on the west coast or for people living on the east coast? (tip: the U.S. Census Bureau web site is an excellent source for information about every state—think about using it to gather your data! http://www.census.gov/)
- Do people who live in Minneapolis spend more each week on groceries than people who live in St. Paul?
- Do people with brown eyes study more hours per week than people with blue eyes?
- Do certain food items cost more at Cub Foods than the do at Rainbow Foods?
- Do men’s jeans cost more than women’s jeans?
- Is a person’s heart-rate higher when he/she is sitting or standing?

You certainly do not have to use any of the above ideas, but they may give you a good starting point! Just keep in mind, as you are trying to come up with an idea, about how you will be collecting data. You want to be able to collect your data relatively quickly.

Be sure to check out the class web site for other links to data sets on the web (click on Student Resources on the homepage):

http://www.coled.umn.edu/edpsych/Foundations/methodology/intro_stats/default.html

Step 2. Sharing your idea

Before you begin collecting data, it is important that you share your idea with me first and get approval. I am primarily concerned that your idea is appropriate for the assignment and that you will collecting the right kind of data (i.e., quantitative data, not categorical data). The purpose of e-mail assignment #3 is for you to share your idea with me and get immediate feedback. Once I approve your idea, you are free to begin collecting data!

Step 3. Collecting data

You must have at least 15 people (or cases) in each of your groups.

You can collect data in a variety of ways, depending on your project topic. Data collection may simply be a matter of logging onto the Internet, going to the grocery store, or asking questions of friends, family, and classmates. To the greatest extent as possible, try to gather a random sample of data. If this is not possible, that’s okay for the purposes of this assignment.

Once you have your data, please show me, either via e-mail (see e-mail assignment #4) or in person.
Step 4. Beginning the project

The project will consist of five distinct parts.

A. Introduction

Talk about your project idea, how you came up with the idea, what your null and alternative hypotheses are (e.g., do you think one group will have a greater mean than another, or do you simply think the groups will be different?), and how you gathered your data.

B. Describing your groups

Create a histogram for each of your groups (e.g., if you are comparing males and females on GPA, one histogram will be male GPA and one will be female GPA). Compute summary statistics for each group and discuss what the graphs and summary statistics tell you about the two groups. Talk about any similarities and differences you detect between the groups, and indicate which summary statistics (based on the shapes of your distributions) would most accurately summarize your two variables.

C. Constructing 95% confidence intervals

For each group, construct a 95% confidence interval. In your own words, interpret the intervals.

D. Conduct a two-sample t-test

Conduct the two-sample t-test or the paired t-test. Write out your null and alternative hypotheses. Talk about the results of your hypothesis test. What was the p-value? Interpret the p-value in your own words. Based on the results of the hypothesis test, do you reject or fail to reject Ho?

E. Conclusion and Summary

Briefly summarize what you did for this project and what you found. Discuss any shortcoming of the methods you used to gather data. Did you discover anything that surprised you when you analyzed the data? Do you think the results would have been different if you had bigger sample sizes? If you had to do the project again, how would you do it differently?

This project is worth 35 points. The point breakdowns for the different parts of the project are given below:

1. Introduction (7 points)
2. Describing the groups (7 points)
3. Constructing confidence intervals (7 points)
4. Conduct the appropriate hypothesis test (7 points)
5. Conclusion and Summary (7 points)