

First Writing Assignment

Write a short paper (1-2 pages, double-spaced, typed) on the question assigned for your section. These are to be turned in **before** class on Thursday, February 21. (Do not disrupt the class to turn your paper in—there will be a penalty of one full letter grade for papers turned in during the lecture. If turned in after class or later that day, the penalty is 1/3 of a letter grade.) Present your answers totally in your own words—do not quote material either from the website, the lecture powerpoints, or anyone else.

A-01. Researchers report on a correlational study which used samples to evaluate whether UCSD graduates earn higher salaries than SDSU graduates ten years after graduation. Be very clear about what the research hypothesis is, what the null hypothesis is, and what prediction about the sample would be made to test the research hypothesis. Why does one need to consider the null hypothesis? Explain how the notion of statistical significance figures in the test of the hypothesis. Assume that the results of the study are not statistically significant (.05). Explain what that means, what conclusion one should draw, and why.

A-02. Write a tutorial to explain to someone who does not know about correlations how to go about making a prediction based on a correlation. Explain all the information they need to use and the steps they must take. Illustrate all the important points in the tutorial using an example of a correlation found in a newspaper, textbook, or science journal article or data you make up. If you make up your own data, determine the needed values by using the applet available in the module on Linear Regression on the Inquiry website (instead of selecting one of the preset datasets, simply start typing in values for x and y in the appropriate places, use *enter* to create new rows, and select *update display* to show a scatter plot and the relevant values you need).

A-03. Imagine that you are part of a group of investigators considering whether there is a relationship between having fluoride in a community's drinking water and insanity in that community. Propose operational definitions of these variables and explain the strengths and weaknesses of your proposal in terms of construct validity. Explain what constitutes the null hypothesis and the research hypothesis, as well as what are the possible Type I and II errors in this scenario. Which error are the investigators likely to be more wary of, and why? What are some things that your team can do to try to reduce the likelihood of committing a Type I error? A Type II error? Finally, what other factors make this a complex and sensitive relationship to be investigating?

A-04. Your colleagues have done a study in which they found that how agreeable someone was (measured on a ten-point personality questionnaire where 1 is least agreeable and 10 is most agreeable) correlated with the length of time the person remains committed to a relationship. The Pearson coefficient is $-.99$ and the regression coefficient is -2.1 . The researchers report $p < .001$. One night your sister (or brother—modify the genders below as appropriate) tells you that her boyfriend was just tested on the same personality questionnaire and scored a 10. Your sister thinks that having a wonderful personality is a fabulous thing and announces plans to marry this man, envisioning a long and highly committed relationship. She has never heard of a Pearson coefficient, a regression coefficient, or a p-value. Explain very carefully why, given your colleagues' study, you do not think this is advisable. Make her understand clearly what the Pearson coefficient and regression coefficients are and what the p-value means. Do not recapitulate the scenario in your paper; just start explaining things to her based on the scenario.