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LIS 397.1

INTRODUCTION TO RESEARCH IN  
LIBRARY AND INFORMATION SCIENCE

1998 July 2  
Wyllys

IN-CLASS MIDTERM

You will have 50 minutes for this part of the exam. Pace yourself accordingly. Keep this part of the exam; you will need it for the take-home part.

1. (10 points) State a definition of a general hypothesis.
2. (10 points) State a definition of a statistical hypothesis.
3. (20 points each) For each of the following situations, describe succinctly what statistical procedure(s) might be appropriate. This includes some or all of the following: saying what statistical technique would be appropriate; if the technique is one that includes a built-in null hypothesis, stating that hypothesis in terms of the problem situation (i.e., not merely stating the abstract null hypothesis); and indicating briefly what kind of sample(s) and sampling procedure would be involved.

A. You are the learning-resources specialist in a large elementary school. Like all intelligent Americans, you are increasingly concerned about the inadequacies of elementary and secondary education in the United States. You feel that as a learning-resources specialist, you are making a substantial--and sadly underappreciated--contribution to fighting against the deterioration of U.S. education. You believe strongly that students who use your learning-resources center regularly have a good chance of actually learning something from school, in spite of the problems they face in the rest of the school environment; and you would like to be able to prove this to your principal, to the superintendent, and to the rest of the school bureaucracy whose efforts to overwhelm you with red tape and demands for paper shuffling too often come perilously close to succeeding.

An idea occurs to you: perhaps you might be able to demonstrate a relationship between your students' frequency of borrowing learning-resources materials and their scores on the achievement tests of which your school system's bureaucrats are so fond. Assuming that your school uses the Hog-Heaven Test of Basic Skills as its main achievement test, what could you do to check out your idea?

B. The city you live in, Gogettem, Texas, is constantly striving to attract new businesses and industries. The City Council and the Chamber of Commerce are especially interested in attracting the kind of industry that they persist (despite frequent evidence to the contrary) in regarding as low on the scale of contribution to pollution, viz., high-tech industries. As director of the Gogettem Public Library, you believe that an underrecognized factor, in the process by which such industries select among cities competing for them, is the "quality of life" in the cities. You believe, furthermore, that a good public library is important to a community's quality of life, and you would like to demonstrate this to the City Council prior to its next review of your library's budget. (You wouldn't mind demonstrating it to the Chamber of Commerce, too.) You go so far as to think that you might even be able to substantiate your idea that companies that are especially environmentally aware tend to be especially likely to take the quality of the public libraries of cities into account in choosing among the cities for new plant sites.

Using one of the online information services to which your library subscribes, you gather data on a large number of selections, made during the last two years by high-tech companies, of cities in which they will build new plants. Available to you are data from the Environmental Protection Agency by which you can rate the companies, in comparison with their competitors, as being low, typical, or high in the number of pollution violations in their plants.

Also available to you are data by which you can rate the public libraries in the cities selected as mediocre, average, or superior. What could you do with such data to shed light on your idea?

C. You are the director of a large academic library system, and a good friend of yours from your student days at the GSLIS is the director of a nearby large public library system. Your two library systems have approximately the same number of microcomputers, but you have wound up with different brands predominating. Your system has mostly Bell microcomputers, while your friend's system has mostly Packemin microcomputers. The two sets of computers were installed at approximately the same time, about one year ago. What is concerning both you and your fellow alum is the matter of repairs to your microcomputers. Both of you agree that repairs are required too frequently.

Both of you also agree that for planning future purchases of microcomputers, your best guide to the dependability of the two brands is your experience with your current equipment. Assuming that the overall frequency of repairs to the microcomputers in each of the two library systems has not changed significantly over time during the past year, how could the two of you use your respective systems' data on repairs to judge which brand is more likely to need repairs? Both of you have data that tell you month by month how many computers have had to be repaired during the past year.

D. About 18 months after you and your fellow alum made the reliability comparison outlined in the previous question, the two of you get together again, and again you start talking about microcomputers, among other things. By this time, both of you have the impression that repairs to your microcomputers are being needed more and more often. However, this may be due simply to your having paid more attention to the repairs because your state is in an economic slump, and library budgets have been cut. Both of you have continued to keep your monthly records of repairs. How could you use the data you have to check on whether repairs are actually being required increasingly frequently as time goes by?