SUGGESTED COURSE EXTENSIONS

A. Reviewing

1. In your statistics textbook or a journal article in your field, find an example of a highly correlated association.
    a. Is that association causal? Why or why not?
    b. List facts or comparisons that could be used to evaluate the substantive meaning of the association.
        i.   What facts do the authors report and interpret in the article?
        ii. What are some other facts or comparisons that could be used to improve the explanation in the article?

2. In your statistics textbook or a journal article in your field, find an example of an association with a low correlation or nonstatistically significant association.
    a. Is that association causal? Why or why not?
    b. List facts or comparisons that could be used to evaluate whether the association is substantively meaningful.
        i.   What facts do the authors report and interpret in the article?
        ii. What are some other facts or comparisons that could be used to improve the explanation in the article?

3. In a newspaper or magazine, find a scientific or policy problem and solution that are currently being touted for implementation.
    a. Evaluate how the article addresses each of these aspects of "importance." Does the article
        i.   specify a cause-and-effect type of relationship?
        ii. provide a plausible argument for a causal association?
        iii. discuss bias, confounding, or reverse causation?
        iv. report results of statistical tests for that association?
        v.   assess whether the expected benefits of the proposed solution are big enough to outweigh costs or otherwise matter in a larger social context?
    b. Given your answers to part a, write a short description of the appropriateness of the proposed solution.

B. Writing and Revising

1. Identify an aspect of your main research question that involves the association between two variables. Do you hypothesize that that association is causal?
    a. If so, describe the mechanisms through which the hypothesized causal variable affects the hypothesized outcome variable.
    b. If not, explain how those variables could be correlated. Identify possible bias, confounding factors, or reverse causation.

3
CAUSALITY, STATISTICAL SIGNIFICANCE, AND SUBSTANTIVE SIGNIFICANCE

    c. Rewrite your research question as a hypothesis, making it clear whether the association you are studying is believed to be causal.
    d. What background facts could you find to help assess the substantive meaning of the association? Look them up and make the assessment.
    e. Write a description of the substantive importance of the association for a discussion section of a scientific paper.
    f. Write a statement for a lay audience, explaining the nature of the association between the variables.

2. For one or two key statistical results pertaining to the main research question in your paper, identify ways to quantify the broad social or scientific impact of that finding.
    a. Locate statistics on the prevalence of your issue.
    b. Find information on the consequences of the issue. E.g., what will it cost in terms of money, time, and other resources? What are its benefits? What does it translate into in terms of reduced side effects, improved skills, or other dimensions suited to your topic?
    c. Use the information from parts a and b in conjunction with measures of effect size and statistical significance from your analysis to make a compelling case for or against the importance of the topic.

3. Repeat question B.2 for a paper you have previously written about an application of a quantitative analysis.