

Case 1: Reviewing a Flawed Analysis

Part 1:

A chemist has analyzed data and the results will be sent to the EPA in support of product submission/approval. His supervisor suggested that he contact a statistician to make sure that the data have been analyzed appropriately. The chemist visits with you and asks that you look over his results and send an email message indicating that the analysis is fine. You consult with the chemist to understand the experiment and the data, ask for the raw data, and do your own statistical analysis. Unfortunately, the chemist has analyzed the data incorrectly and your statistical analysis yields a result contrary to the chemist's result, which may decrease the chance of receiving approval from the EPA. The chemist is unhappy and wants to submit his results.

1. What would your response be?
2. What if the chemist was your boss?
3. What if the chemist's analysis was flawed, but the results were consistent with what you found in your analysis?

Part 2:

You report to a chemist (not the same chemist) who is not an advocate of statistics and a few days later your supervisor invites you to a meeting in his office. Although he neglects to specify the agenda for the meeting you know the topic. You go to the meeting and the attendees are your supervisor, the chemist, and his supervisor. Your supervisor tells you that he wants you to sign off on the chemist's analysis so that it can be submitted to the EPA.

1. What would your response be?
2. Does the fact that you are outnumbered 3 to 1 make a difference in your decision?
3. Would your decision be any different if you felt that your job or future promotions/raises were in jeopardy?
4. Would you consider putting the responsibility for signing off on a flawed analysis on your supervisor and remove yourself from the situation?

Case 2: Incomplete Data

An up-and-coming junior faculty, known as a rising star for her clinical expertise and research productivity and publications in high-impact journals, asks you to do a very simple data analysis with two groups: treatment vs. control. She only had means and SDs for the control group, but full data for the treated group. She refused to supply the raw data for the control group until she finally admits that there is none. Somebody else collected the data but didn't have it anymore, and the means and standard deviations were estimates from memory by that person. Eventually, she supplied his phone number, and he confirmed this to be true. Unfortunately, a disgruntled employee quit and took the data with her so it was unrecoverable.

1. Would you perform the analysis, even though the control data cannot be verified?
2. What would your response be if the difference between the groups was either obviously very different, or obviously not-different (ie, the result of the analysis is quite obvious)?
3. What if she is your academic advisor? What if instead of junior faculty, she's your department chair (or boss) and you're about to go up for tenure (or a promotion)?

Case 3: “After the Fact” Co-author?

As a professional statistician, you are called by a colleague to examine and “bless” a biomedical experimental report. You are urged to do it quickly because the report has already been submitted and accepted for publication in a prestigious journal in the author’s field. One of the reviewers, however, had suggested that a quick review by a statistician might be in order. To your horror, the report appears to be utter statistical nonsense. The data were not sampled according to any plan, but rather were drawn from various similar experiments done for different purposes. There is no reason to assume the observations were random or independent within or among data sets. There was no definition of how many data points had been originally available or how those used had been selected. The scatter plots within the paper were plainly skewed, but the computer statistical tests which had been run would have presumed a normal distribution. You explain gently that the statistical work is not an asset to the paper and could prove embarrassing to the author and the institution if published. You suggest that he eliminate the statistical portions and describe his work based on the qualitative reasoning which he obviously used. Initially very angry, he calms down and says, “I’ll leave the contents alone, but I will add you as a coauthor. How’s that?”

1. How do you reply? How is your reply conditioned by the relative power positions you may hold?
2. What if the colleague is new to the department and you are already a tenured faculty? What if you are equals in the department? What if this person is your boss or department chair, and you’re going up for promotion/tenure in a few months?
3. If you are unable to reach an accommodation with the author, under what conditions, if any, would you write to the journal editor to preclude publication? Under what conditions, if any, would you decline to comment on the paper yourself, but refer the author to another colleague whose statistical expertise you consider to be so minimal that he or she might approve the paper as written?

Case 4: Uncounted Data from the Scintillation Counter

The following case was borrowed from materials for the Third Intercollegiate Ethics Bowl (1997), prepared by the Center for the Study of Ethics in the Professions at Illinois Institute of Technology. Used with permission.

Armstrong is a first year graduate student, working in a molecular biology laboratory. She has great admiration for Hayes, who is just finishing his thesis work. He seems to have a golden touch in the laboratory. His experiments produce clean data, with scatter consistently less than or equal to theoretical predictions. Because his experiments seldom need to be repeated, Hayes has produced a thesis full of fascinating and demonstrably correct results. The laboratory has already followed up on several of these with success. One day Armstrong notices Hayes leaving the scintillation counter and can't help noticing he has 80 vials. This barely registers in her subconscious until later in the day he shows her his experimental results with 40 data points. When she asks about the missing points, he explains that it is standard practice to eliminate outliers from the analysis. He goes on to mention that the scintillation counter is a scientific instrument that frequently produces murky readings distorted by many different kinds of factors. The more Armstrong thinks about this, the more distraught she becomes. A week later she summons up her courage and tells her story to the professor in whose lab she and Hayes work. He seems uninterested and irritated. He hoped she had come to present him her experimental results, which she hasn't done for months.

1. What, should Armstrong do next, if anything, and why?
2. Would it make a difference if she noticed the discrepancy while reviewing a draft paper for publication?
3. Would it make a difference whether she was to be a co-author on the paper?
4. Would it make a difference if she were not a student, but a professor of statistics in a different department of the same university?
5. Would it make a difference if she and Hayes were professional colleagues in a cancer research laboratory? Would it make a difference if she were Hayes' advisor or mentor?

Name: _____

Tell me something about how your role in a situation changes how you may (or may not) think about the ethics or your options. Thanks.

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