Ethical Requirements of a Research Assistant Who Is Concerned About the Behavior of a Supervisor

Andrew Gelman

A reader writes:
"I have a hypothetical question about ethics in statistics. For a research assistant, do you think there is an ethical responsibility to inform your supervisor/principal investigator if they change their analysis plan multiple times during the research project in a manner that verges on p-hacking? Or do you think that the hierarchy within this relationship places the burden on the supervisor/principal investigator and not the research assistant?"

I don't know how hypothetical this question is, given that the reader asked for anonymity and also requested that I mask some identifying information.

In any case, this sort of question comes up a lot, and I think it helps to unbundle it. The first question is purely statistical: Is the analysis actually inappropriate for the problem at hand? Second, assuming the analysis is wrong, what are the ethics of the supervisor's behavior in performing this analysis? Third, what are the ethical responsibilities of the research assistant here? Finally, what should the research assistant do in this situation?

In attempting to answer these questions, I am not setting myself up as some sort of ethics arbiter; rather, I hope that by exploring these issues, I can help people make their own informed decisions.

The Supervisor

To start with, is the supervisor's behavior actually unethical here? Is it even bad statistics or bad science? Is it unethical to "change an analysis plan multiple times during the research project in a manner that verges on p-hacking"? It depends.

It's unethical to change the plan and hide those changes. It's not unethical to make these changes openly.

Then comes the analysis. What's important in the analysis is not whether it accounts for all the plans that were not done. Rather, what's important is that the analysis reflects the theoretical perspectives embodied in these analysis plans.

For example, if the original plan says that variable A should be important and the later plan says that variable B should be important, then the final analysis should include both variables A and B. If the original plan says that the effect of variable A should be positive and the final plan says the effect should be negative, then the final analysis should respect these contradicting theoretical perspectives rather than just going with whatever noisy pattern appeared in the data.

My point here is that the ethics depend not just on the data and the steps of the analysis; the ethics also depend on the substantive theory that motivates the data collection and analysis choices.

Assessing Behavior

I guess assessing the supervisor's behavior depends a bit on the social relevance of the application area. If the supervisor is p-hacking on the way to a journal paper

about extra-sensory perception, then I guess all that's at stake is the integrity of science, some research funding, and the reputation of Ivy League universities, so no big deal. But if he's *p*-hacking on the way to a claim about the effectiveness of some social intervention, whether it be early childhood or food labeling in schools, then there are some policy implications to exaggerating results.

Indeed, even if there's no *p*-hacking at all, we can expect published estimates to be overestimates, and that seems like an ethical problem to me. Somewhere in between are claims with no direct policy implications that still have ideological implications. For example, a *p*-hacked claim that beautiful parents are more likely to have daughters does not directly do any damage—except to the extent that it is used as ammunition in a sexist political agenda.

The most immediately dangerous cases would be manipulating an analysis to make a drug appear safer or more effective than it really is. I guess this happens all the time, and yes, it's unethical!

The Research Assistant

I'd say that the burden of the researcher's position is on the supervisor. I admire whistleblowers, but it's awkward to say there's an ethical responsibility to blow the whistle, given the possibility of retaliation by the supervisor.

I'd prefer to say that the supervisor has an ethical responsibility to set up a working environment where it's clear that subordinates can express their concerns without fear of retaliation. The institution where everyone is working has the ethical responsibility to enforce the concept that subordinates can express their concerns without fear of retaliation. Society has an ethical responsibility to enforce that institutions allow safe complaints.

Finally, I don't know what to recommend the research assistant do. In similar situations, I've suggested an indirect approach: Instead of directly confronting the supervisor, make a positive suggestion that the analysis would be improved by a clearer link to the underlying substantive theory.

You can also express concerns by invoking a hypothetical third party: Say something like, "A reviewer might be concerned about possible forking paths in the data coding and analysis, and maybe a multiverse analysis would allay such a reviewer's concerns." In doing this, you ideally can align the incentives of scientific progress, your supervisor, and yourself.

It's too bad that a research assistant has to spend their time strategizing in this way rather than just doing the work, but in practice, we each have to spend some time constructing the house in which we live. ◖

About the Author

Andrew Gelman is a professor of statistics and political science, and director of the Applied Statistics Center at Columbia University. He has received many awards, including the Outstanding Statistical Application Award from the American Statistical Association and the award for best article published in the *American Political Science Review*. He has coauthored many books; his most recent is *Red State, Blue State, Rich State, Poor State: Why Americans Vote the Way They Do*. He is editor of the Ethics and Statistics column.