Research Ethics

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1 Introduction

The scenarios below are attempts at getting at some situations you may encounter at some point, and that could be difficult to respond to. The point is to realize that research ethics isn't only about egregious violations (like faking your data) but is in fact about the subtler things that you'll confront all the time. Remember that your reputation as an honest person is more important, even in terms of your professional standing, than how many papers you publish and where you publish them.

2 Scenarios

Each of the hypothetical scenarios given below actually happened (and I know about it) or something nearly identical happened. Some of these scenarios are clear cut, and what to do is obvious. For others, it may require you think hard before answering. Note your immediate reaction, but also think about ethics - and what someone else might think about your response to the scenario. Consider whether you would respond the same way if you knew no one would know what you did, or if everyone would.

1. You and your co-authors are writing a paper about a method you have developed, and you are comparing your method A to the best alternative method, B. Your method A is doing better than method B on the datasets you are studying, and so you are preparing the manuscript with this comparison for a prestigious conference. Two weeks before the deadline, you realize the details about how method B was run are not in the paper. Your co-author did the analysis, so you ask your co-author for the details (version number and commands used). Unfortunately, the version he used is an old one, and the method B has been largely overhauled since then. What do you do? Start over and redo all the analyses? Include the data you have and not report the version number? Include the data and report the version number, but not include a discussion in the paper about how this is an old version so perhaps results would be different with the updated version? What if you can't complete the analyses before the deadline?

2. Same question as the previous, but now assume you didn't find out about the version being an old one before the paper was submitted. What do you do? Do you retract the paper? Do you let the program chair know about the problem before the decision is made? What do you do if you find out about the version being outdated after the paper is accepted?

3. Same question as the previous, but suppose you're the person who used the wrong version. Do you tell your co-authors? How do you tell them?

4. You are writing a paper about a method you are designing that has some algorithmic parameters. You use a collection of datasets to select the default algorithmic parameters that perform best on those "parameter tuning data". You then test your method using these default parameters against other methods in a sequence of experiments on "test data". At some point you realize that the test data and the parameter tuning data have a substantial overlap. What do you do?

5. You are writing a paper about a method you are designing that has some algorithmic parameters. You use a collection of datasets to select the default algorithmic parameters that perform best on those "parameter tuning data". You then test your method using these default parameters against other methods in a sequence of experiments on "test data". You find that there's an experiment where your default parameters don't work very well (and the competing methods are much better), but changing the parameter values gives better results for your method for that case so that your method is now better than the competing method. What do you do? Comment on each of the following responses. (1) You change the parameter for that experiment and show the results for that changed value. (2) You remove the experiment from the paper. (3) You remove the best competing methods from the paper. (4) You realize that the parameter values that work well in this experiment were not considered in your parameter tuning stage, so you go back to the parameter tuning data and add the new (and better) parameter values. If on the parameter tuning data, your method improves using that new parameter setting, then you update the default value for the parameter to this new value, and redo the testing stage. If on the parameter tuning data your method does not improve with the new parameter setting, you add new parameter tuning data so that you can get the result you want, and reset the default setting.

6. You are writing a paper introducing a new method A, and you plan to submit it to a major conference. Your co-author has the responsibility for performing the study on real world datasets, and on the datasets he picked your method is better than the competing methods, nearly all the time. Close to the deadline to submitting the paper, you find another benchmark collection of real world datasets for your problem, and on these your method is clearly worse than the best competing method. Suppose

your co-author doesn't want to include the results you obtained, because then the paper might not get accepted to the conference. What do you do?

7. You are writing a paper about your new method and you find a benchmark collection of datasets to use to study your method in comparison to other methods. Let's refer to this as Benchmark set A. You do the comparisons and your method outperforms another method on these datasets. Later you find out that some of the datasets in Benchmark set A have been identified by the developers as problematic, so they have created a Benchmark set B that excludes some of the datasets in Benchmark set A. You note that your method does particularly well on the datasets that were removed, and you worry that switching to Benchmark set B will hurt your chances of the paper getting accepted. What should you do? Does your thinking change if it is not well known that there are some problematic datasets in Benchmark set A? Does your thinking change if others have used Benchmark set A, and published results using it, even after the problems were identified? What if Benchmark set B was never published, but in the paper introducing Benchmark set A the authors note that some of the datasets are problematic, so they don't report results on the problematic datasets?

8. You are writing a paper about a method A and you want to compare to another method B. The paper that introduces B has a default mode that you are using. However, in that paper, they have a comment that their default can reduce accuracy, and that a slight modification produces more reliable results. Your method A does well compared to default B, but not so well compared to the slightly modified version of B. What should you do? Is it okay to report results only for default B, if the comment is not that obvious in the paper?

9. You're a theoretician and you've proven a beautiful theorem and submitted it to a major conference. You discover after the paper is submitted that there's a gap in a proof, but you aren't sure if the theorem is or isn't true. What do you do? What if the paper is accepted before you find the gap? What if the paper is in press?

10. You review a paper for a conference and you discover something you can improve. What do you do? If the paper is accepted, but not yet published, is it okay to start working on it? What are your obligations?

11. Your co-author introduces a problem to you and you work on it. As you are writing it up, you find out that the problem and ideas came from a paper that is unpublished and your co-author reviewed. What do you do?

12. You strongly dislike someone and are asked to review a paper by them for a program committee. What do you do? What if you really like the author instead of dislike them?

13. You are on a program committee and you read a review of a paper that is scathing and that results in the paper being rejected. In your opinion, you think the review is also unfair. The person who wrote the paper is your friend. Do you warn your friend about the reviewer?

14. You're on a program committee and you see a scathing review by someone that you know has a personal or professional feud with the primary author on that paper. Do you tell the PC chair? (Ditto for extremely positive review, where the reviewer is a close friend of the primary author on the paper.)

15. People who serve on proposal review panels at NIH or NSF are obliged to keep the proposal confidential, and also to not reveal anything about the reviews outside of the panel (except with the government officials handling the panel). Suppose someone senior to you asks you to read a proposal he is reviewing for NIH or NSF. What do you do? Or, what if you are serving on a panel, and someone senior to you asks you what was said about his proposal. What do you do?

16. You are writing a paper or proposal. Do you cite all the relevant papers, or do you omit to cite papers by people you dislike?

17. Something published in arXiv is not yet peer reviewed. Suppose you come up with the same result. Can you submit it and not cite the article in arXiv?

3 Discussion

The "right response" to each of the scenarios above may be considered straightforward by some people and not so straightforward by others. For context, see [1] to have a sense of what my own expectations are for appropriate behaviour in my lab. These expectations inform how I would want my trainees to handle these scenarios.

As you can see, there are many tricky situations that can arise when doing research that can result in uncomfortable situations. In many of the cases above, the challenges have to do with experimental work, but theoretical work also presents its challenges.

As you consider these scenarios, ask yourself what your reasons are for the choice you make. There are competing factors: academic success is one, time pressure is another, and even reasons like "other people do these kinds of things, so why shouldn't I?" can come into play.

Also, see if you are able to identify a way of responding to the scenario that you think is most consistent with research integrity. And if you can, then see whether you are confident you would be able to make that choice, even if it causes you some loss (of prestige, of opportunity, etc). Which of the scenarios is the hardest for you to feel confident that you would do "the right thing"?

In general, dealing with these issues is non-trivial, so don't expect yourself to always know the right thing to do and to be able to do it. We're all human, after all! But do try keep trying.

References

[1] Tandy Warnow. Principles for experimental research in computing in the Warnow Lab, 2024. Published online at `https://tandy.cs.illinois.edu/guidelines_experimental_work.pdf`.